Vol. 990 Number 2

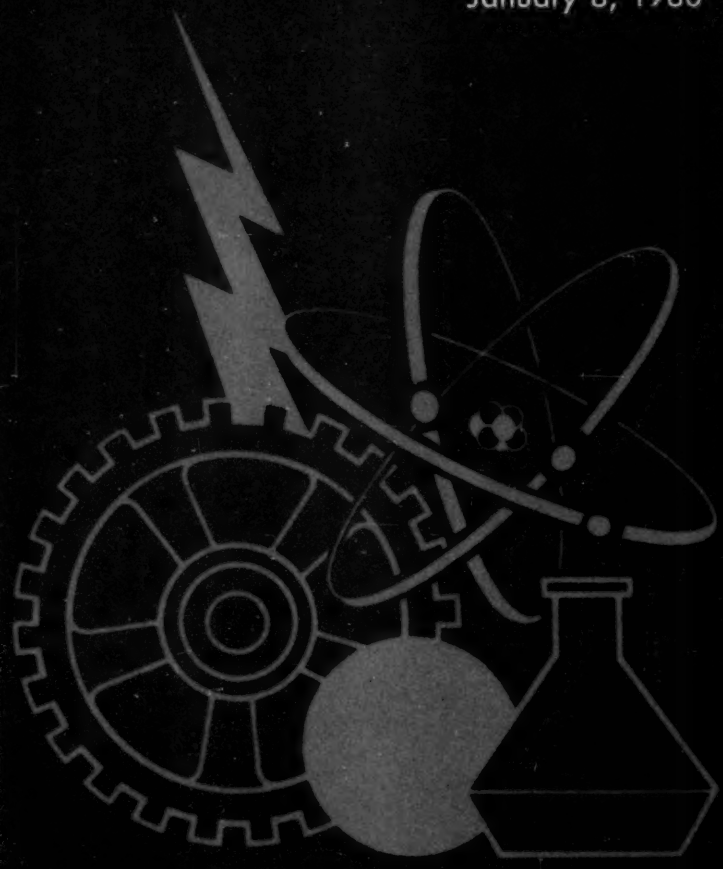
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

January 8, 1980



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

January 8, 1980 Volume 990 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

LUTRELLE F. PARKER,
July 3, 1979. *Acting Commissioner of Patents and Trademarks.*

National Inventors' Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, February 9, 1980 from 1:00 p.m. to 5:00 p.m. and Sunday, February 10, 1980 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the ceremony at 2:00 p.m. on Sunday, February 10, 1980, during which four inventors will be inducted into the National Inventors Hall of Fame.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, February 8, 1980 at 5:00 p.m. We would appreciate the cooperation of all users of the Search facilities by removing all personal property and items for the early closing.

LUTRELLE F. PARKER,
Nov. 27, 1979. *Acting Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,744,101, Re. S.N. 071,210, Filed Aug. 30, 1979, Cl. 24/221 K, DETACHABLE QUARTER-TURN BLIND HOLE FASTENER, Paul R. Gley, Owner of Record: *Rexnord Inc., Milwaukee, Wis.,* Attorney or Agent: Ernest W. Schultz, et al., Ex. Gp.: 355

3,884,617, Re. S.N. 091,562, Filed Nov. 5, 1979, Cl. 431/170, FLUIDISED BED HEATER, Michael John Virr, Owner of Record: *Stone-Platt Fluidfire Limited, Dudley, England,* Attorney or Agent: John Clarke Holman, et al., Ex. Gp.: 345

4,000,723, Re. S.N. 078,499, Filed Sep. 24, 1979, Cl. 123/73 AA, ENGINE VALVE MEANS AND PORTING, Eyvind Boyesen, Owner of Record: *Performance Industries, Inc., Huntingdon Valley, Pa.,* Attorney or Agent: John T. Synnestvedt, et al., Ex. Gp.: 342

4,001,529, Re. S.N. 079,501, Filed Sep. 27, 1979, Cl. 200/39 R, PERCENTAGE TIMER, Joseph J. Mahon, Owner of Record: *The Singer Company, New York, N.Y.,* Attorney or Agent: Bayard H. Michael, et al., Ex. Gp.: 217

4,046,703, Re. S.N. 088,221, Filed Oct. 25, 1979, Cl. 192/107 M, TRACTION FLUIDS, Irl N. Duling, et al., Owner of Record: *Sun Oil Company of Pennsylvania, Philadelphia, Pa.,* Attorney or Agent: J. Edward Hess, et al., Ex. Gp.: 352

4,050,173, Re. S.N. 078,971, Filed Sep. 25, 1979, Cl. 38/143, LAUNDRY FEEDING APPARATUS, Niels Johan Olsen, et al., Owner of Record: *Beta, S.A., Luxembourg, Luxembourg,* Attorney or Agent: Sidney Wallenstein, et al., Ex. Gp.: 353

4,057,724, Re. S.N. 091,773, Filed Nov. 6, 1979, Cl. 250/343, DETERMINATION OF THE ALCOHOL CONTENT OF BLOOD, Werner Karl Adrian, et al., Owner of Record: *Inventors,* Attorney or Agent: Edward J. Handler III, et al., Ex. Gp.: 256

4,066,260, Re. S.N. 087,034, Filed Oct. 22, 1979, Cl. 273/73 C, METAL-PLASTIC COMPOSITE RACQUET, Robert E. Rodgers, Jr., Owner of Record: *Leach Industries, Inc., San Diego, Calif.,* Attorney or Agent: James E. Nolan, et al., Ex. Gp.: 334

4,072,412, Re. S.N. 085,478, Filed Oct. 17, 1979, Cl. 355/3 TR, IMAGE TRANSFER DEVICE, Masashi Suda, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Joseph M. Fitzpatrick, et al., Ex. Gp.: 212

4,075,216, Re. S.N. 088,211, Filed Oct. 24, 1979, Cl. 546/270, SUBSTITUTED BENZOTHIAZOLINES AND THEIR USE AS PLANT GROWTH REGULANTS, John J. D'Amico, Owner of Record: *Monsanto Company, St. Louis, Mo.,* Attorney or Agent: Richard H. Shear, et al., Ex. Gp.: 121

4,081,309, Re. S.N. 088,802, Filed Oct. 29, 1979, Cl. 156/250, METHOD OF MAKING A COMPOSITE LABEL WEB, William A. Jenkins, Owner of Record: *Monarch Marking Systems, Inc., Dayton, Ohio,* Attorney or Agent: Joseph J. Grass, Ex. Gp.: 161

4,082,024, Re. S.N. 077,945, Filed Sep. 24, 1979, Cl. 83/402, POTATO STRIP CUTTER, Joseph L. Hodges, et al., Owner of Record: *Ore-Ida Foods, Inc., Boise, Id.,* Attorney or Agent: Philip A. Mallinckrodt, et al., Ex. Gp.: 323

4,125,016, Re. S.N. 091,223, Filed Nov. 5, 1979, Cl. 73/139, BATTERY OPERATED TORQUE WRENCH WITH DIGITAL DISPLAY, Kenneth A. Lehoczky, et al., Owner of Record: *G.S.E. Inc., Farmington Hills, Mich.,* Attorney or Agent: Allen M. Krass, et al., Ex. Gp.: 244

4,133,956, Re. S.N. 090,807, Filed Nov. 2, 1979, Cl. 544/336, PREPARATION OF BENZOYLUREAS, Riaz Fazal Abdulla, et al., Owner of Record: *Eli Lilly and Company, Indianapolis, Ind.,* Attorney or Agent: Arthur R. Whale, et al., Ex. Gp.: 122

4,134,537, Re. S.N. 091,509, Filed Nov. 5, 1979, Cl. 235/379, TRANSACTION TERMINAL, Paul F. Glaser, et al., Owner of Record: *Transaction Technology, Inc., Los Angeles, Calif.,* Attorney or Agent: Charles H. Schwartz, et al., Ex. Gp.: 235

4,145,456, Re. S.N. 079,847, Filed Sep. 28, 1979, Cl. 427/38, METHOD OF PRODUCING INTERNALLY COATED GLASS TUBES FOR THE DRAWINGS OF FIBRE OPTIC LIGHT CONDUCTORS, Dieter Kuppers, et al., Owner of Record: *U.S. Philips Corporation, New York, N.Y.,* Attorney or Agent: Thomas A. Briody, Ex. Gp.: 162

4,160,658, Re. S.N. 088,212, Filed Oct. 24, 1979, Cl. 71/90, SUBSTITUTED BENZOTHIAZOLINES AND THEIR USE AS PLANT GROWTH REGULANTS, John J. D'Amico, Owner of Record: *Monsanto Company, St. Louis, Mo.,* Attorney or Agent: Stanley M. Tarter, et al., Ex. Gp.: 122

4,160,767, Re. S.N. 090,723, Filed Nov. 2, 1979, Cl. 260/244.4, VINCA ALKALOID INTERMEDIATES, Jean C. Miller, et al., Owner of Record: *Eli Lilly and Company, Indianapolis, Ind.,* Attorney or Agent: Arthur R. Whale, et al., Ex. Gp.: 122

PATENT NOTICES

Certificates of Correction for the Week of Jan. 8, 1980

Plt. 4,439	4,129,927	4,158,059	4,167,200
D. 252,175	4,130,850	4,158,295	4,167,244
D. 252,569	4,131,683	4,158,640	4,167,245
D. 252,602	4,137,323	4,159,180	4,167,562
D. 252,929	4,139,903	4,159,782	4,167,620
D. 253,007	4,140,461	4,159,855	4,167,635
3,779,165	4,141,977	4,159,928	4,168,261
3,798,207	4,142,837	4,161,989	4,168,268
3,906,046	4,143,020	4,162,162	4,168,271
3,916,791	4,143,980	4,162,511	4,168,738
3,931,054	4,145,444	4,162,574	4,168,760
3,984,282	4,145,451	4,162,950	4,169,212
4,072,962	4,145,549	4,163,208	4,169,558
4,082,998	4,147,282	4,164,025	4,169,668
4,085,650	4,147,663	4,164,126	4,169,805
4,088,146	4,148,913	4,164,395	4,169,897
4,096,053	4,149,585	4,165,038	4,170,551
4,107,383	4,149,695	4,165,139	4,170,838
4,111,643	4,150,279	4,166,740	4,170,839
4,115,476	4,151,279	4,166,869	4,170,907
4,124,710	4,153,435	4,166,922	4,171,515
4,125,067	4,156,749	4,167,190	4,174,035
4,127,259			

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions having been rendered that the respective patentees were not the first inventors with respect to the claims lists.

Patent No. 3,688,755, H. G. Grayson, E. F. Miller, FUEL SUPPLY SYSTEM FOR REDUCED EXHAUST EMISSION, Interference No. 99,538, decided June 15, 1979, claims 1, 5–8.

Patent No. 3,842,922, E. R. Fagin, C. F. Latter, VEHICLE WEIGH SCALE, Interference No. 99,368, decided July 25, 1979, claims 1–4.

Patent No. 3,904,986, K. G. Hernqvist, GAS LASER TUBE, Interference No. 99,335, decided July 13, 1979, claims 1, 3, 4, 5, 9 and 10.

Patent No. 3,942,455, K. H. J. Wallis, INCINERATOR AND METHOD, Interference No. 99,698, decided July 18, 1979, claim 9.

Patent No. 3,952,475, J. H. Paskert, FASTENER AND JOINT FORMED THEREWITH, Interference No. 99,619, decided Aug. 2, 1979, claim 2.

Patent No. 3,966,706, V. Ramanathan, 2,6-DIHYDROXY-3-CYANO - 4 - METHYLPYRIDINE CONTAINING AZO DYES WHICH CONTAIN A FUNCTIONAL AMINO GROUP, Interference No. 99,715, decided June 14, 1979, claims 1–10 and 14.

Patent No. 3,973,408, G. H. Paverman, CONSTRUCTION OF UNDERGROUND DAMS AND EQUIPMENT THEREFOR, Interference No. 99,727, decided Oct. 22, 1979, claims 3 and 4.

Patent No. 4,034,092, D. A. Berges, 7-ACYL-3-(CARBOXYALKYL AND CARBAMOYLALKYL SUBSTITUTED OXADIAZOLYLTHIOMETHYL) CEPHALOSPORINS, Interference No. 100,131, decided Nov. 9, 1979, claim 4.

Patent No. 4,049,388, G. E. Scheitlin, R. F. Little, CENTER AIR MANIFOLD FOR CATALYTIC CONVERTER, Interference No. 99,957, decided Sept. 7, 1979, claims 1 and 2.

Dedications

4,007,631.—*Mansoor Ali Saifi* and *Sotirios John Vahaviolos*, East Windsor Township, Mercer County, N.J. METHOD AND APPARATUS FOR EVALUATING WELDS USING STRESS-WAVE EMISSION TECHNIQUES. Patent dated Feb. 15, 1977. Dedication filed Oct. 1, 1979, by the assignee, *Western Electric Company, Incorporated.*

Hereby dedicates to the Public the entire term of said patent.

4,162,144.—*William A. Cheney*, Cincinnati, Ohio. METHOD AND APPARATUS FOR TREATING ELECTRICALLY CHARGED AIRBORNE PARTICLES. Patent dated July 24, 1979. Dedication filed Nov. 9, 1979, by the assignee, *United Air Specialists, Inc.*

Hereby dedicates to the Public the entire term of said patent.

Disclaimers

3,510,950.—*Peter Andrews*, Penfield, N.Y. SINE, PINHEADED DUAL SQUARE. Patent dated May 12, 1970. Disclaimer filed Nov. 6, 1979, by the inventor.

Hereby enters this disclaimer to claims 14 and 15 of said patent.

3,753,511.—*Heinz Ruch*, Basel, Switzerland. CONTAINER AND CLOSURE THEREFOR. Patent dated Aug. 21, 1973. Disclaimer filed Oct. 9, 1979, by the assignee, *Albert Obrist A.G.*

Hereby enters this disclaimer to claims 1, 2, 5, 6, 8, 9 and 10 of said patent.

4,165,560.—*Yasushi Matsumoto*, Narashino, Japan. METHOD FOR MANUFACTURING A DIAMOND STYLUS FOR VIDEO DISC PLAYERS. Patent dated Aug. 28, 1979. Disclaimer filed Oct. 12, 1979, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 7, 8, 9, 10 and 13 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 17, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	12-22-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-4-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-30-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-2-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-9-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-17-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jaw, Fishing, Etc.; Butchering; and Books and Printed Matter.	10-19-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-30-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	2-29-78

Expiration of patents: The patents within the range of numbers indicated below expire during November 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,061,833 to 3,066,301, inclusive
Plant Patents..... Numbers 2,189 to 2,197, inclusive

REISSUES

JANUARY 8, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

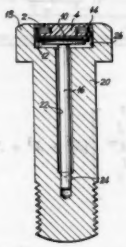
Re. 30,183
RADIO-FREQUENCY TUNED-CIRCUIT MICRODISPLACEMENT TRANSDUCER

Charles H. Popenoe, 6307 Wiscasset Rd., Bethesda, Md. 20016

Original No. 4,114,428, dated Sep. 19, 1978, Ser. No. 726,140, Sep. 24, 1976. Application for reissue Oct. 16, 1978, Ser. No. 951,995

Int. Cl.[2] G01L *5/00*

U.S. Cl. 73—761 **11 Claims**



9. A strain-stress detecting system comprising:

a fastener member subject to deformation when stressed wherein one portion thereof moves relative to another portion;

a resonant circuit assembly carried by said member and having an inductor component and a capacitor component, one of said components being secured in fixed relation to said one portion of said member and the other of said components having relatively movable portions one of which is fixed relative to said one portion of said member and the other of which is secured to said other portion of said member whereby deformation of said member changes the resonant frequency of said circuit assembly; and

external means movable into proximity to said member and having means for exciting said assembly into resonance and detecting the resonant frequency thereof.

Re. 30,184
HOLDERS FOR TAPE CASSETTES

Peter Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Lenzerheide, Switzerland

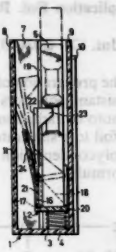
Original No. 4,030,601, dated Jun. 21, 1977, Ser. No. 582,118, May 30, 1975. Application for reissue Nov. 2, 1978, Ser. No. 957,200

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1974, 2427109

Int. Cl.[2] B65D *85/672*

U.S. Cl. 206—387 **13 Claims**

11. A holder for tape cassettes and the like, the holder comprising a housing having at least one compartment with an open front side to slidably receive a slider in the compartment, a slider in the housing and adapted to transport a cassette into and out of said compartment, the slider having a cassette-engaging rear wall spaced inwardly from said open front side of the housing, stop means to limit the length of sliding movement of the slider, locking means being provided to hold the slider with a cassette in its compartment against the force exerted by a spring in the housing and urging the slider into its open position, at least one cassette reel retention member brakingly engaging into a cassette reel aperture when said slider is locked, said one retention member being mounted at said slider rear wall and being pivotable, together with said rear wall in a plane perpendicular to the direction of sliding



in response to and upon movement of the slider into its open position and thereby disengaging from said reel apertures.

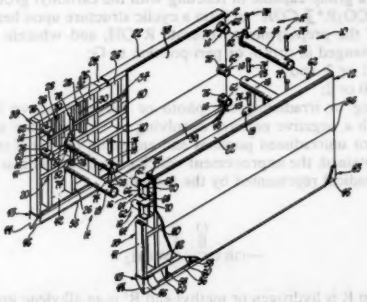
Re. 30,185
TRENCH SHORING ASSEMBLY

James L. Griswold, 513 Morningside Dr., Battle Creek, Mich. 49015

Original No. 4,019,329, dated Apr. 26, 1977, Ser. No. 656,145, Feb. 9, 1976. Application for reissue Apr. 10, 1978, Ser. No. 894,770

Int. Cl.[2] E21D *5/12*

U.S. Cl. 405—283 **19 Claims**



1. A trench shoring assembly comprising a pair of spaced wall means for vertical disposition within a trench, and connecting means interconnecting said wall means for allowing limited pivotal movement between said wall means, said connecting means including a plurality of support means rigidly attached to each of said wall means adjacent each end thereof and extending from said wall means in opposite directions toward one another, a plurality of spreader means extending between opposed pairs of said support means for spacing said wall means apart, said spreader means overlapping a portion of said support means and including slot means extending through the overlapping portions of said spreader means and said support means, and pin means extending through said slot means for attaching said spreader means to said support means and being at least in part larger than said pin means for allowing said limited movement between said spreader means and said support means.

Re. 30,186
METHOD FOR THE PREPARATION OF RELIEF STRUCTURES

Roland Rubner, Rottenbach u. Forchheim; Wolfgang Kleeberg, and Eberhard Kuhn, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

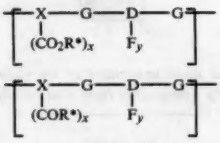
Original No. 4,040,831, dated Aug. 9, 1977, Ser. No. 598,829, Jul. 24, 1975. Application for reissue Dec. 22, 1978, Ser. No. 972,432

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1974, 2437348

Int. Cl.[2] **G03C** *5/00*

U.S. Cl. 430—325 **7 Claims**

1. In a method for the preparation of relief structures consisting of highly heat resistant polymers comprising the steps of applying a soluble, photo or radiation-sensitive prepolymer in the form of a film or foil to a substrate, said prepolymer being a poly-addition or polycondensation prepolymer having repeating units of the formula:



wherein,

X and D each comprise a carbocyclic and/or heterocyclic nucleus;

G is selected from the group consisting of amide, urea or urethane linkages;

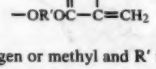
R* is an organic radical containing a photo- or radiation induced di- or polymerizable olefinic double bond; and is a component of ester group $[CO_2R^*]$ *COR** said group bound to said nucleus in ortho or peri-position to G;

F is a group capable of reacting with the carbonyl group of $[CO_2R^*]$ *COR** to form a cyclic structure upon heating of the prepolymer to liberate R*OH; and wherein F is arranged in ortho- or peri-position to G;

x is 1 or 2; and

y is 0 or 2;

exposing or irradiating the photo or radiation active layer through a negative pattern, dissolving or stripping the unexposed or unirradiated portions and annealing the relief structure obtained; the improvement which comprises using as said R*, a radical represented by the formula:



wherein R is hydrogen or methyl and R′ is an alkylene group.

Re. 30,187
PLURAL CHANNEL ERROR CORRECTING APPARATUS AND METHODS

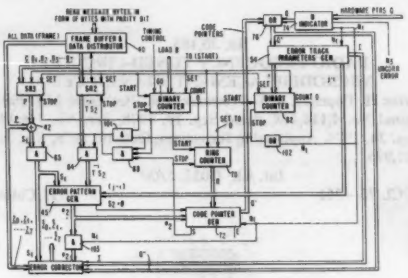
Se J. Hong, Poughkeepsie, N.Y., and Arvind M. Patel, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Original No. 3,868,632, dated Feb. 25, 1975, Ser. No. 390,136, Aug. 20, 1973. Continuation-in-part of Ser. No. 306,975, Nov. 15, 1972, abandoned. Application for reissue Feb. 22, 1977, Ser. No. 771,042

Int. Cl.[2] **G06F** *11/12*

U.S. Cl. 340—146.1 AL **58 Claims**

47. Apparatus for identifying and correcting errors in one or two tracks of digital information derived from a multi-track medium, bits of data from ones of the tracks forming a byte, said tracks including a parity track, said bytes including n data bytes D_1–D_n and an error checking code ECC byte of i bits, said error checking code ECC being related to said data bytes according to the relation



$$ECC = \begin{bmatrix} n=7 \\ m=1 \\ \Sigma\, D_n X^m \\ n=1 \\ m=7 \end{bmatrix} [X^0 + X^3 + X^4 + X^5 + X^6]$$

comprising:

logic means for operating sequentially upon each of n received data bytes and an ECC byte to produce an error term E, said error term being equal to zero in the absence of errors in the received data and ECC bytes;

second logic means for regressively operating upon said error term $-i$ times to produce the vector EC^{-i};

means for accepting signals representative of data bits of the digital information and responsive thereto for deriving a parity character P_n which in combination with a data byte D_n produces an even number of data bits of a first kind;

combining means for logically combining a regressed error vector and a parity vector P_n on a bit-by-bit basis to form the expression $EB^{-i}+P_n$;

a data correction matrix;

parity correction logic means coupled to said logic means and to said means for accepting for receiving an error vector and a parity vector and operative to apply a signal to said data correction matrix to correct the ith data track to conform with said parity vector when said regressed error vector equals said parity vector;

means for receiving track pointers indicating the presence of errors in ones of said tracks and for disabling the correction apparatus when three or more tracks are in error;

track separation logic means coupled to said means for receiving and responsive to track pointers for identifying the separation (i–j) between a most significant track i which is associated with a lower-order polynomial term and a least significant track j which is associated with a higher-order polynomial term of the polynomial

$$\sum_{n=1}^{m=7} D_n X^m$$

a divisor generator coupled to said track separation logic for selecting the term $1+B^{-(i-j)}$ in accordance with track separation (i–j);

dividend logic means for dividing said regressively operated

vector by the output of said divisor generator to produce an error vector e_{nj} for data in the least significant track j in error;

logic means for combining on a bit-by-bit basis said derived parity character P_n and said error vector e_{nj} to produce an error vector e_{ni} for data in the most significant track i in error;

means for associating said error vectors e_{ni} and e_{nj} with the data tracks i and j respectively; and

said data correction matrix receiving uncorrected data and said error vectors and combining said data and said vectors to invert the polarity of erroneous bits of said uncorrected data in accordance with the characteristics of said error vectors.

PLANT PATENTS

GRANTED JANUARY 8, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,491

CHRYSANTHEMUM PLANT

Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840

Filed Sep. 14, 1977, Ser. No. 833,375
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—75 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat. plant known by the name Bandit and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, pompon capitulum type (commercial double), red-bronze ray floret color, diameter across face of capitulum up to 40 mm., short plant height, spreading branching pattern, average natural season flowering date of September 27, and average flowering response period of seven weeks in photoperiodic controlled short day programs.

4,492

CHRYSANTHEMUM PLANT

Jack M. Meek, and William E. Duffett, both of Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Jul. 18, 1978, Ser. No. 925,970
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., known by the cultivar name Cirbronze and particularly characterized as to uniqueness by the combined characteristics of daisy capitulum type; flat capitulum form; medium bronze ray floret color, diameter across face of capitulum from 55 to 75 mm. at maturity; uniform nine week flowering response to photoperiodic control; medium plant height; and semi-spreading branching pattern.

PLANT PATENTS

GRANTED JANUARY 5, 1960

PATENTS

GRANTED JAN. 8, 1980

ERRATA

For CLASS	See PATENT NO.
433–174	4,182,034
433–228	4,182,035
433–002	4,182,036
433–110	4,182,037
433–085	4,182,038
433–054	4,182,039
433–077	4,182,040
433–115	4,182,041
083–177	4,182,170
083–467 R	4,182,186
099–578	4,182,226
433–068	4,182,312
414–685	4,182,456
126–422	4,182,489
418–132	4,182,602
430–338	4,182,629
430–558	4,182,630
430–314	4,182,647
435–002	4,182,653
435–272	4,182,654
435–181	4,182,655
435–034	4,182,656
209–045	4,182,673
548–178	4,182,711
548–140	4,182,712
548–259	4,182,713
549–014	4,182,716
525–482	4,182,732
528–332	4,182,792
526–077	4,182,801
526–264	4,182,802
526–313	4,182,803
528–073	4,182,812
525–437	4,182,841
424–273 B	4,182,893
367–119	4,183,007
367–142	4,183,008
367–117	4,183,009
367–154	4,183,010
403–096	4,183,018
324–103 P	4,183,025

PATENTS

GRANTED JAN. 8, 1980

ERRATA

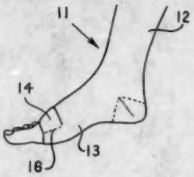
CLASS	PATENT NO.
433-174	4,182,034
433-228	4,182,035
433-002	4,182,036
433-110	4,182,037
433-085	4,182,038
433-054	4,182,039
433-077	4,182,040
433-172	4,182,041
062-177	4,182,170
083-467 R	4,182,198
099-578	4,182,234
433-084	4,182,172
414-085	4,182,456
126-422	4,182,484
418-132	4,182,077
420-138	4,182,020
420-578	4,182,030
430-114	4,182,047
439-002	4,182,042
439-272	4,182,074
435-781	4,182,155
073-034	4,182,006
209-047	4,182,477
340-178	4,182,711
340-140	4,182,712
340-259	4,182,711
340-014	4,182,710
325-482	4,182,702
325-322	4,182,703
325-077	4,182,801
325-094	4,182,802
325-313	4,182,817
325-077	4,182,841
325-427	4,182,843
124-277 R	4,182,243
367-119	4,182,007
367-142	4,182,008
367-177	4,182,009
367-124	4,182,010
403-090	4,182,212
324-102 P	4,182,052

PATENTS

GRANTED JANUARY 8, 1980

GENERAL AND MECHANICAL

4,181,982
STOCKING WITH CONVERTIBLE TOE OPENING
Iraida V. Segovia, 270 Upland Dr., San Francisco, Calif. 94127
Filed Mar. 20, 1978, Ser. No. 890,645
Int. Cl.[2] A41B *11/06*
U.S. Cl. 2—239 **3 Claims**



1. A stocking with a convertible toe opening comprising a leg enclosing portion extending above the wearer's knee, and a foot enclosing portion having an opening for the toes and inner and outer toe closing bands adjacent the opening, the inner band extending across the bottom of the foot enclosing portion and the outer band extending across the top of the foot enclosing portion, both bands being sewn together at the sides of the foot enclosing portion in a single horizontal seam, the foot enclosing portion being otherwise seamless whereby the wearer can fold first the inner band and then the outer band over the toes to completely enclose them.

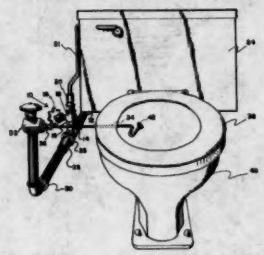
4,181,983
ASSIMILABLE HYDROPHILIC PROSTHESIS
R. K. Kulkarni, 4207 Briggs Chaney Rd., Beltsville, Md. 20705
Filed Aug. 29, 1977, Ser. No. 828,659
Int. Cl.[2] A61F *1/00, 13/00*
U.S. Cl. 3—1 **22 Claims**

1. An assimilable prosthesis than can be implanted in a body cavity, comprising a porous hydrophilic body formed by the removal of solvent by lyophilization or selective leaching, without substantial volume change, from a substantially homogeneous solution in liquid organic solvent of (a), an assimilable normally hydrophobic polymer composed primarily of polymerized units of a saturated, aliphatic hydroxy carboxylic acid, and (b), a small amount of a physiologically acceptable wetting agent, which amount remains in the polymer and is sufficient to impart hydrophilicity to said body.

4,181,984
Patent Not Issued For This Number

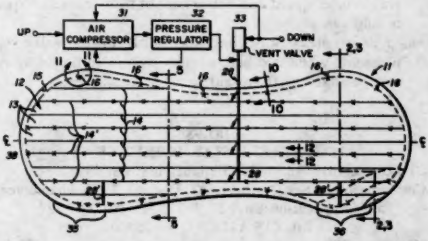
4,181,985
SANITARY SPRAY ATTACHMENT FOR TOILET BOWL
Roberto R. Rius, 2220 Barrington Ct., South San Francisco, Calif. 94080
Filed Mar. 20, 1978, Ser. No. 887,972
Int. Cl.[2] E03D *9/08*
U.S. Cl. 4—7 **1 Claim**

1. A spray attachment for connection to a conduit supplying water to the tank of a toilet bowl having a seat spaced above the bowl, comprising a first valve connected to said conduit and controlling flow to said tank; a second valve receiving water from said conduit; a flexible tube having a portion passing between the upper part of said bowl and said seat and receiving water from said second valve; said flexible tube having an upwardly directed nozzle mounted on the outward end thereof substantially in the center of said bowl, in an operating position of the device, including a swivel joint pivotally attaching said nozzle to said flexible tubing for moving said nozzle into and out of said operating position, said swivel joint located and oriented such that the nozzle may be pivoted



against an inner side of the said bowl when the nozzle is moved out of the said operating position.

4,181,986
METHOD OF COVERING AND UNCOVERING A SWIMMING POOL
Harry E. Aine, 30600 Page Mill Rd., Los Altos, Calif. 94022
Division of Ser. No. 516,204, Oct. 21, 1974, Pat. No. 3,927,427, which is a continuation-in-part of Ser. No. 367,198, Jun. 5, 1973, abandoned. This application Sep. 15, 1975, Ser. No. 613,443
Int. Cl.[2] E04H *3/16, 3/18*
U.S. Cl. 4—172.14 **2 Claims**



1. The method for selectively covering and uncovering a region of a swimming pool comprising the steps of:

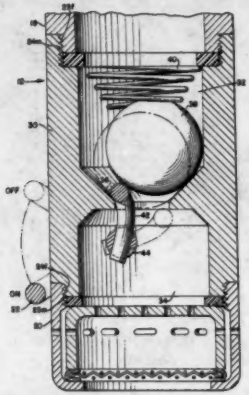
floating a bendable thermally insulative sheet-shaped cover in a swimming pool for covering a region thereof;

selectively applying a sinking force to a sinkable first portion of said cover to sink said first portion to a lower level in the pool liquid than a second portion of the cover, said second portion having a positive buoyancy to cause the positively buoyant second portion to have an upwardly directed force exerted thereon which is opposite to the force producing the sinking of said first portion of the cover to cause the cover to bend and thus to be folded within the pool, thereby uncovering a region of the pool for swimming.

4,181,987
ON-OFF SNAP ACTION WATER AND HEAT SAVING VALVE ATTACHMENT FOR SINK SPOUT

Joseph J. Kesselman, c/o The Abacon Agency, 16 Pont St., Great Neck, N.Y. 11021

Filed Oct. 5, 1978, Ser. No. 948,788
Int. Cl.[2] E03C 1/00, 1/04
U.S. Cl. 4—191 10 Claims



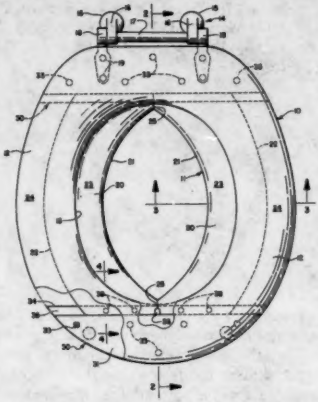
1. An attachment for use between a sink spout and the non-splash aereator for said spout, said attachment comprising:
a casing having a generally longitudinal axis;
means, including a passageway along said longitudinal axis, for operatively connecting said sink spout to said non-splash aereator;
a partial partition across said passageway dividing said passageway into a first chamber and a second chamber;
the side of said partition closer to said spout defining a valve seat;
a ball in said first chamber adapted to seat against said valve seat;
spring means for normally biasing said ball against said valve seat, whereby, when said ball is seated, the said passageway is interrupted and water cannot flow from said spout to said aereator;
snap action means for lifting said ball from said valve seat, whereby, when said ball is lifted, water can flow through said passageway from said spout to said aereator.

4,181,988
ADJUSTABLE SIZE TOILET SEAT

Bill Skaggs, 1010 Annin St., Philadelphia, Pa. 19147

Continuation of Ser. No. 641,442, Dec. 17, 1975, abandoned. This application Dec. 27, 1977, Ser. No. 864,727
Int. Cl.[2] A47K 13/00, 13/06
U.S. Cl. 4—237 4 Claims

1. An adjustably sized toilet seat, comprising:
(a) a primary seat member having a pair of laterally displaced side elements extending in a longitudinal direction, said primary side elements being arcuately contoured for defining a first arcuate opening, said primary side elements having an inner edge arcuate contour;
(b) auxiliary seat means having a pair of discrete laterally displaced side elements being arcuately contoured for defining a second arcuate opening, each of said auxiliary side elements being slidably displaceable only in a lateral direction with respect to each other and with respect to said primary seat elements for maintaining said second arcuate opening in substantially a similar contour with respect to said first arcuate opening independent of said sliding displacement positional location of said auxiliary side elements;
(c) auxiliary seat side element locking means in said guideways and said auxiliary seat side elements for cooperatively engaging said auxiliary seat side elements and said

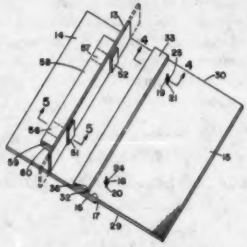


primary side elements at at least one predetermined position;
(d) said auxiliary side elements being slidingly displaceable within guideways formed within said primary seat member side elements, said guideways extending in said lateral direction.

4,181,989
MATTRESS ELEVATING DEVICE

John J. Bradley, and Frances L. Bradley, both of 2000 Fairfield Dr., Wilmington, Del. 19810

Filed Feb. 6, 1978, Ser. No. 875,732
Int. Cl.[2] A47C 21/08
U.S. Cl. 5—509 9 Claims

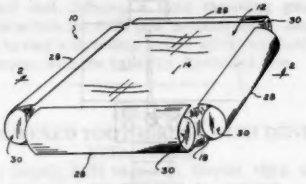


1. A mattress elevating device composed of components easily and quickly assembled and disassembled without the use of tools, said components being suitably sized to be packed and transported in a suitcase, said device comprising panel members arranged with adjacent edge portions thereof in overlapping relationship to provide a substantially flat upper mattress supporting surface, means releasably securing the panel members together in said overlapping relationship, means secured to one of said panel members for preventing movement of the overlapped edge portion of the other panel member outwardly away from said one member, and means releasably mounted on the bottom of one of said panel members for supporting one end of the assembled panel members in a raised position.

4,181,990
PERIMETER SUPPORT FOR A WATERBED MATTRESS

Philip J. Santo, 100 Fernwood Ave., Rochester, N.Y. 14621

Filed Apr. 13, 1978, Ser. No. 896,036
Int. Cl.[2] A47C 27/08; A47G 9/00
U.S. Cl. 5—452 3 Claims



1. In a waterbed having a flexible liquid-containing bladder, said bladder having upper and lower surfaces with a plurality of substantially vertical side walls interconnecting said upper and lower surface, such liquid within said bladder exerting lateral forces on said side walls, a perimeter support for said side walls, said perimeter support comprising:

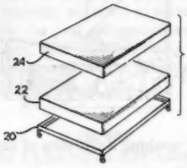
at least two sleeves connected to said upper and lower surfaces of said bladder to be co-extensive with at least two of said plurality of side walls respectively, said sleeves formed of a sheet of flexible material, of stable dimensions under tension, attached to the external surface of said bladder adjacent to the marginal edges of said upper and lower marginal edges of said surfaces so as to be coextensive with said vertical side walls; and

at least two self contained chambers encasing a compressible medium, said chambers slidably retained within said sleeves respectively and bearing against said sleeves and said vertical side walls so that said sleeves urge said chambers against said side walls to counteract said lateral forces exerted by such liquid, thereby providing support for said side walls.

4,181,991
MATTRESS FOUNDATION

Charles W. Morgan, Rolling Hills; Dale Robinson, Placentia, and Farouk Farag, Union City, all of Calif., assignors to United Foam Corporation, Compton, Calif.

Filed Feb. 9, 1978, Ser. No. 876,466
Int. Cl.[2] A47C 23/04
U.S. Cl. 5—400 5 Claims



1. A mattress foundation comprising:

a lower wooden frame assembly having peripheral lower frame members defining upward facing surfaces;

a partially flexible upper wooden frame assembly having peripheral upper frame members overlying said peripheral lower frame members so as to define oppositely disposed upper and lower frame surfaces,

a plurality of slats extending between and fastened to the sides of said upper frame assembly and distributed over its length to define an open support surface,

flexible foam members distributed about the periphery of said frame assemblies and cemented to said oppositely disposed upper and lower frame surfaces,

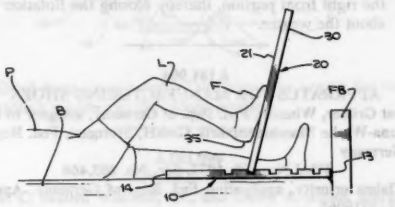
a foam pad disposed over said upper frame assembly and slats, and

a fabric cover over said mattress foundation.

4,181,992
REPOSITIONING A BED PATIENT

Sidney H. Blake, 8403 Clarinda Ave., Pico Rivera, Calif. 90660

Filed Jun. 15, 1978, Ser. No. 915,940
Int. Cl.[2] A47C 21/00
U.S. Cl. 5—443 5 Claims



1. In the art of repositioning a patient in a hospital bed after he has slid down towards the foot board of the bed, the method comprising the steps of:

selecting a first elongated relatively flat rigid member having a plurality of longitudinally spaced retaining means on one side thereof;

positioning said first member lengthwise upon the surface of the bed with one end of said member engaging the foot board and said retaining means being upwardly disposed;

selecting a second elongated rigid member having a flat longitudinal surface thereon, and having one end adapted to removably engage a selected retaining means on said first member;

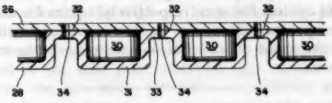
placing said second member in a substantially vertical position spaced away from the foot board, with said flat surface facing away from the foot board, and with said one end removably engaging a selected one of said retaining means; and

then raising one foot of the patient, while the patient's knee is bent, and placing the foot upon said flat surface so that the patient, by straightening his leg, may move himself towards the head of the bed.

4,181,993
FLOTATION GARMENT

Ralph H. McDaniel, 370 Lime Cir., Henderson, Nev. 89105

Filed Oct. 11, 1977, Ser. No. 841,027
Int. Cl.[2] B63C 9/12
U.S. Cl. 9—329 4 Claims



1. A flotation vest comprising:

first and second sheets of a thermoplastic material composed of a member selected from the group consisting of a polyolefin film, a polystyrene film, a polyvinyl chloride film, and a polyester film, bonded face to face along a rectilinear grid work of seams forming a spaced array of mutually isolated air cells which are a plurality of vacuum formed, hollow, cup shaped cavities formed in said first thermoplastic sheet and bonded to said second thermoplastic sheet which is relatively flat, along said rectilinear grid work of seams by raising the temperature of said first and second sheets to their softening point, said first and second sheets being cut into a back portion, a right front portion

and a left front portion, said back portion being joined to said left front portion along first and second thermally bonded seams forming a left arm hole and said back portion being joined to said right front portion along first and second thermally bonded seams forming a right arm hole, said gridwork seams of said first and second sheets having perforations therethrough for ventilation;

a zipper composed of a polyester thermoplastic material having a left half thermally bonded to said left front portion and a right half thermally bonded to said right front portion for selectively fastening the left front portion to the right front portion, thereby closing the flotation vest about the wearer.

4,181,994

APPARATUS FOR MANUFACTURING SHOES

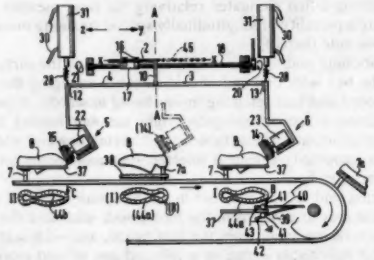
Ernst Grüber, Winzeln, Fed. Rep. of Germany, assignor to Fortuna-Werke Maschinenfabrik GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 28, 1977, Ser. No. 855,464

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1977, 2715064

Int. Cl.[2] A43D *119/00*

U.S. Cl. 12—1 A **7 Claims**



1. In an apparatus for manufacturing shoes comprising an endless circulating conveyor adapted to hold shoes upside down in a detachable manner and tools arranged in a row for processing the shoe bottom parts, with individual shoe lasts arranged on the conveyor in a paired alternating arrangement with the shoe toes alternately pointing in opposite directions the improvement comprising,

a template having an edge corresponding to the contour of shoe bottom parts to be worked and adapted to be moved parallel to the conveyor backwards and forwards,

two independently arranged control linkages having spring-biased end parts, respectively, engaging said edge of said template on mutually opposite long sides thereof,

shoe bottom part processing tools connected to other ends of said control linkages, respectively, means for maintaining the speed of advance of the conveyor substantially equal to the speed of travel of said template in the two directions.

4,181,995

MODULAR STRUCTURE FOR BRIDGES, OVERPASSES AND ROADWAYS

Henry C. Zur, 10 W. Griswold Ave., Phoenix, Ariz. 85021

Filed Oct. 11, 1977, Ser. No. 841,096

Int. Cl.[2] E01D *1/00*

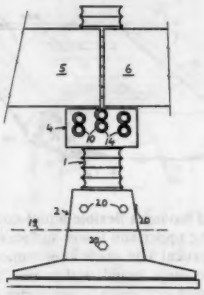
U.S. Cl. 14—1 **11 Claims**

1. A bridge structure of modular elements comprising:

a. a plurality of spaced bases each formed with an upper opening for the insertion of a colum;

b. a plurality of columns formed inserted in each said opening an with horizontal flutings dimensioned for the insertion of cores between said flutings and complementary flutings in the an other components to be fastened to said columns and serving as variable positioning means for horizontal beams

c. a shetled position beam on said column also provided with said complementary flutings and cores as securing means to said column and to road carrying elements



d. said road forming elements being provided with fluted means positioning and securing said element on said beams and on foundations provided with complementary securing means.

4,181,996

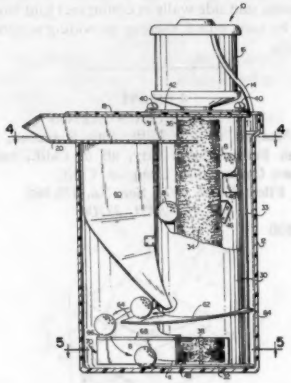
MACHINE FOR WASHING GOLF BALLS AND THE LIKE

J. Richard Hollrock, 51 Longview Dr., Simsbury, Conn. 06070

Filed Mar. 20, 1978, Ser. No. 888,490

Int. Cl.[2] A63B *47/04*

U.S. Cl. 15—21 A **20 Claims**



1. A machine for washing a plurality of uniform balls or the like comprising:

a tub having an opening at the top and a closed bottom for holding a quantity of cleaning solution;

a scrubbing chamber including a generally cylindrical shell extending vertically in the tub and defining a stowage space between the tub and shell for holding a plurality of balls to be scrubbed and a rotatable scrub brush mounted coaxially within the shell in spaced relationship from the cylindrical shell wall, the lower end of the shell having an inlet opening for admitting balls to be scrubbed and the cleaning solution, the shell also including track means leading from the lower end to the upper end in the space between the shell and the brush for carrying the balls sandwiched between the brush and shell upwardly as the brush rotates and scrubs the balls;

motor means for rotating the scrub brush coaxially within the shell; and

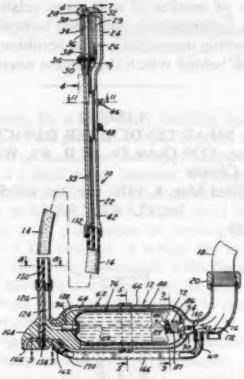
feeding means leading from the stowage space between the tub and the shell to the inlet opening for feeding balls deposited loosely in the stowage space in an orderly manner to to the inlet opening of the shell, the feeding means including conduit means connected to the inlet opening of the shell and defining a fluid throttling passageway through which the balls pass in serial order, the conduit means having a throttling orifice admitting fluid into the passageway with the balls at a controlled rate.

4,181,997

WATER-POWERED TOOTHBRUSH WITH DENTIFRICE ATTACHMENT

James L. O'Rourke, 6351 Memorial, Detroit, Mich. 48226

Filed Apr. 21, 1978, Ser. No. 898,645
Int. Cl.[2] A46B *13/06*
U.S. Cl. 15—24 **15 Claims**



1. A tooth-brushing device comprising a brushing unit having a rotatable shaft to which bristles are secured, a cartridge unit having means for holding an oral substance, a first passage from said holding means to said brushing unit, a water passage to said brushing unit, said water passage having means releasably attachable to a water faucet, a rotatable impeller operably connected to said shaft, a branch line from said water passage to rotate said impeller by the flow of water in said branch line and thereby rotate said shaft, said holding means comprising a squeezable tube releasably mounted in a chamber in said cartridge unit, whereby the oral substance can be expelled from said tube by squeezing, said chamber being in communication with said water passage so that the pressure of water in said water passage will squeeze said tube.

4,181,998

TUBE CLEANING APPARATUS

Dana W. Nelson, Dexter, Ohio, assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 1, 1978, Ser. No. 930,113
Int. Cl.[2] B08B *9/02*
U.S. Cl. 15—104.14 **3 Claims**

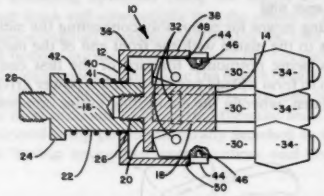
1. A tube cleaning apparatus comprising:

a frame for attachment to a rotatable drive shaft;

a plurality of arms connected to the frame for movement between an extended position and a retracted position;

a plurality of cutter heads secured to the arms for engaging the inside surface of the tube, wherein the cutter heads are spaced from the inside surface of the tube when the arms are in the retracted position;

a contacting member supported by the frame for movement between an open position and a closed position, wherein movement of the contacting member from the open position to the closed position moves the arms toward the retracted position; and



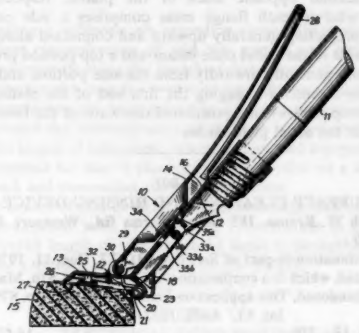
resilient means supported by the frame for urging the contacting member to the closed position.

4,181,999

SPONGE MOP

Daniel C. Maust, Winfield, Ill., and David A. Jones, Dayton, Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed Aug. 2, 1978, Ser. No. 928,772
Int. Cl.[2] A47L *13/146*
U.S. Cl. 15—119 A **6 Claims**



1. A sponge mop comprising:

a handle;

a base plate having connecting means to rigidly secure the base plate to the handle;

a squeeze plate rotatably attached to the base plate;

a sponge affixed to the lowest surface of the squeeze plate;

a sponge wringer rotatably attached to the upper surface of the squeeze plate; and

means for selecting the angle of the handle to the plane of the cleaning surface of the sponge, wherein the means comprises a spring clip and first and second openings defined in the base plate and two tabs on the sponge wringer, the tabs being insertable respectively into the spring clip and first opening to minimize the angle and being insertable respectively into the spring clip and second opening to maximize the angle, thereby allowing the user to lower or raise the mop handle with respect to the surface being mopped.

4,182,000

SCRAPER ATTACHMENT FOR OSCILLATING VIBRATOR SANDERS

Hugh E. Fairbairn, 1422 Summit Ave., Cloquet, Minn. 55720

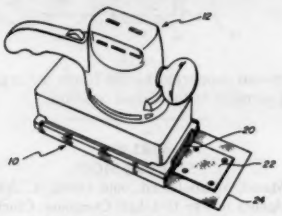
Filed Nov. 27, 1978, Ser. No. 963,957
Int. Cl.[2] A47L *13/08*
U.S. Cl. 15—236 B **23 Claims**

1. An attachment for use with a hand-held power sander of

the type having a power driven platen having first and second opposite ends and first and second opposite sides, the attachment comprising:

a metal plate means having top and bottom surfaces and a front end; and

connecting means for removably connecting the metal plate means to the platen with the front end of the metal plate means being positioned forward of the first end of the platen to form a blade portion which is power driven with the platen, wherein the connecting means comprises:



first and second flange means on opposite sides of the metal plate means for slidably receiving the first and second opposite sides of the platen, respectively, wherein each flange meas comprises a side portion projecting generally upward and connected along one side of the metal plate means and a top portion projecting generally inwardly from the side portion; and

stop means for engaging the first end of the platen, the stop means being positioned rearward of the front end of the metal plate means.

4,182,001

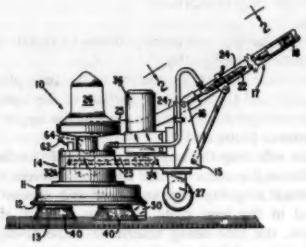
SURFACE CLEANING AND RINSING DEVICE

Helmuth W. Krause, 185 Greens Farms Rd., Westport, Conn. 06880

Continuation-in-part of Ser. No. 531,677, Dec. 11, 1974, abandoned, which is a continuation of Ser. No. 341,576, Mar. 15, 1973, abandoned. This application Feb. 6, 1978, Ser. No. 875,516

Int. Cl.[2] A47L *11/34, 7/00*

U.S. Cl. 15—320 **14 Claims**



1. In a surface cleaning and rinsing apparatus, improved means for cleaning and rinsing floor coverings, such as rugs, carpeting and the like, comprising:

a frame,

a rotor at the bottom of said frame mounted for rotation relative to said frame,

rotor drive means on said frame coupled to said rotor for turning it in a predetermined first direction,

a plurality of brushes rotatably mounted on said rotor and being positioned below said rotor for scrubbing engagement with a floor covering to be cleaned and rinsed, each of said brushes having its axis of rotation spaced away from the axis of rotation of said rotor for revolving in an orbital motion about the axis of rotation of the rotor as the rotor is turned about its own axis,

brush rotating means for contrarotating said brushes with respect to the rotor for rotating them in the opposite direction from the first direction of rotation of said rotor,

said brush rotating means being arranged to rotate each of said brushes at a sufficiently high RPM rate in said opposite direction for causing the peripheral region of each brush furthest from the axis of rotation of said rotor to be travelling in the opposite direction over the floor covering from the direction of the travel of the periphery of the rotor for flipping over and scrubbing the underside of pile on the floor covering,

liquid dispensing means operatively associated with said brushes for applying cleaning or rinsing liquid to the floor covering to be scrubbed by the brushes, and

a plurality of suction nozzles on the underside of said rotor, said suction nozzles being spaced away from the axis of rotation of said rotor and one of said nozzles being positioned behind each of said brushes with respect to the direction of motion of said rotor relative to the floor covering for extracting liquid and loosened dirt from the floor covering immediately after scrubbing by the respective brush behind which the suction nozzle is positioned.

4,182,002

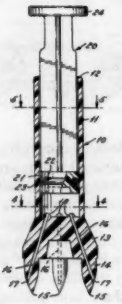
MEAT TENDERIZER DEVICE

Lubomir Holec, 5220 Outer Dr., R.R. #1, Windsor, Ontario, (NGA 6J3) Canada

Filed Mar. 1, 1976, Ser. No. 662,518

Int. Cl.[2] A22C *9/00*

U.S. Cl. 17—30 **13 Claims**



1. In a meat tenderizer device, the combination comprising

a body having a tubular portion,

said body having an enlarged head on one end of said tubular portion,

a plunger mounted for reciprocating movement within said tubular portion and having a sealing means thereon thereby isolating the volume between said seal plunger and said head,

said head having circumferentially spaced axially extending projections with tapered free ends forming points,

and a straight passage extending from each said projection through said projection and said head to the area within said tubular portion between said sealing means and said head,

each said passage having one end terminating in spaced relation to the point of its respective projection,

the other end of each said passage extending to the interior of the tubular portion of said body,

each of each said passage having the major portion of the length thereof within said enlarged head,

said passages extending generally axially and radially inwardly from the periphery of its respective projection

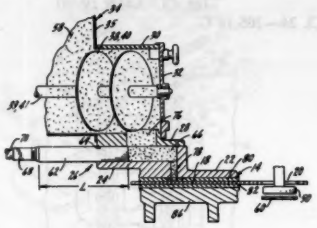
through said projection and said head to the interior of said tubular portion.

4,182,003

FOOD PATTY MOLDING MACHINE

Salvatore P. Lamartino, Burbank; Louis R. Richards, Mokena, and Glenn A. Sandberg, Lockport, all of Ill., assignors to Formax, Inc., Mokena, Ill.

Filed Feb. 28, 1978, Ser. No. 882,121
Int. Cl.[2] A22C *7/00*
U.S. Cl. 17—32 **9 Claims**



1. A drive system for a food patty molding machine of the kind comprising a food product supply hopper, a feed screw for impelling food product from the supply hopper toward the intake opening of a food pump chamber, a plunger for impelling food product through the pump chamber and into a mold inlet passage, a mold plate including a mold cavity, and a cyclic mold plate drive mechanism for moving the mold plate outwardly from a fill position in which the mold cavity is aligned with the mold inlet passage to a discharge position in which the mold cavity is displaced from the inlet passage, and back inwardly from the discharge position to the fill position, the drive system comprising:

a double-acting plunger drive cylinder enclosing a piston, the piston being connected to the plunger;

a hydraulic pump means affording a constant high pressure hydraulic supply and a low pressure hydraulic supply;

a hydraulic drive motor connected to the feed screw;

control valve means having a first operating condition connecting the low pressure hydraulic supply to the plunger drive cylinder to advance the plunger toward the mold inlet passage in a pumping stroke, at a limited speed and under limited pressure, and a second operating condition connecting the high pressure hydraulic supply to the plunger drive cylinder to retract the plunger from the mold inlet passage in an intake stroke, at a high speed;

the valve means, in its second operating condition, further connects one hydraulic supply to the feed screw drive motor to rotate the feed screw during the plunger intake stroke; and

control means to actuate the valve means between its first and second operating conditions in synchronism with the mold plate cycling mechanism so that the second operating condition is maintained during a limited portion of the mold plate cycle with the mold plate displaced from its fill position, and the first operating condition is maintained during substantially the remainder of the mold plate cycle.

4,182,004

MEAT HOOK

Stanley S. Haring, Jr., 440 Oil Hill Rd., and Gary M. Happy, 531 N. Taylor, both of ElDorado, Kans. 67042

Filed Feb. 27, 1978, Ser. No. 881,728
Int. Cl.[2] A22C *15/00*
U.S. Cl. 17—44.2 **2 Claims**

1. An improved thermoplastic meat hook, the hook comprising:

an elongated shank having an annular cross section;

a semicircular bottom portion integrally attached to said shank and having an annular cross section, said bottom portion having a stiffening rib extending outwardly and around the outer circumference of said bottom portion and extending upwardly along the length of said elongated shank and substantially past the center of the length of said elongated shank for distributing the load placed on said bottom portion equally around the circumference of said bottom portion and along the length of said shank, the end of said bottom portion is pointed for ease in inserting into meat products to be carried thereon; and

a semicircular top portion integrally attached to said shank and having an annular cross section, said top portion

having a stiffening rib extending outwardly around the outer circumference of said top portion and extending downwardly along the length of said elongated shank and substantially past the center of said elongated shank for distributing the load placed on said top portion equally around the circumference of said top portion and along the length of said shank, the tip end of said top portion is rounded for ease in placing said top portion on a support rack and suspending the meat therefrom;

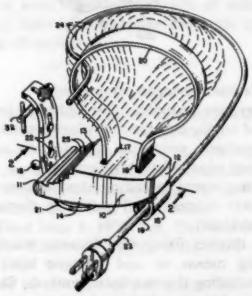
said center of said elongated shank including stiffening ribs on opposite sides of its annular cross section so that the overall length of said elongated shank is strengthened by the stiffening ribs along the length thereof.

4,182,005

ELECTRICAL CORD HOLDER

Michael L. Harrington, 3514 Military Ave., Los Angeles, Calif. 90034

Filed Apr. 27, 1978, Ser. No. 900,590
Int. Cl.[2] F16L *33/00*; A44B *21/00*
U.S. Cl. 24—16 PB **5 Claims**



1. An electrical cord holder comprised of an integral body of polypropylene having front, rear, top and bottom portions and including:

(a) a strap integrally extending from said rear portion,

(b) said body having first and second transverse slots passing

from the bottom to the top of said body between the front and rear portions, and

(c) a projection extending forwardly from the front of said body,

(d) said strap forming a small loop and thence passing up through said first slot and thence forming a large loop and thence passing back down through said second slot,

(e) an end section of the strap having a series of projection receiving openings so that said end section after passing through said second slot can be turned upwardly past the front portion of said body and said projection received in one of said openings, the opposite side walls of said first slot having inwardly and upwardly directed sawtooth serrations and the opposite sides of a portion only of said strap passing through said first slot having outwardly and downwardly directed sawtooth serrations, the remaining portions of the strap being free of serrations, such that the sawtooth serrations on the slot and on the strap portion will interlock and prevent downward movement of the strap through said first slot whereby an end portion of an electrical cord can be passed through said small loop and said small loop contracted about the end portion by pulling the strap upwardly through the first slot thereby securing the body to said end portion of said electrical cord so that it becomes permanently attached and is always available for use, and, whereby thereafter the remaining portion of the electrical cord can be wound up and held in said large loop, pulling of the end section of said strap down through said second slot contracting the large loop about the wound up remaining portion of the cord and subseuuently passing the projection through a juxtaposed opening in said strap section holding the large loop in its contracted state to thereby secure the electrical cord in its wound up configuration for easy storage.

4,182,006

SLIDE FASTENER STRINGER

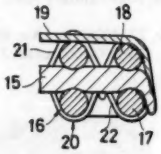
Hiroshi Yoshida, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1978, Ser. No. 918,487

Claims priority, application Japan, Jul. 6, 1977, 52/89408[U]

Int. Cl.[2] A44B *19/00*

U.S. Cl. 24—205.11 F **1 Claim**



1. A slide fastener stringer comprising:

(a) a stringer tape including thermoplastic synthetic fibers;

(b) a row of continuous fastener elements made of thermoplastic synthetic resin and mounted on and along one longitudinal edge of said stringer tape;

(c) reinforcing means extending along said row of continuous fastener elements and including thermoplastic synthetic fibers; and

(d) sewing threads fixing said fastener elements and said reinforcing means to said stringer tape, said sewing threads including thermoplastic synthetic fibers, and there being a cut edge in which said stringer tape, one of said fastener elements, said reinforcing means, and said sewing threads are fused together, and said sewing threads and said stringer tape jointly wrapping and retaining said one fastener element at said cut edge, said reinforcing means comprising a braid mounted on one side of said continuous fastener elements which is remote from said stringer tape, said braid covering and retaining said one element at said cut edge.

4,182,007

SLIDE FASTENER STRINGER

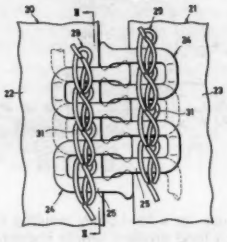
Hiroshi Yoshida; Kihei Takahashi, both of Uozu, and Toyoaki Hayashi, Kurobe, all of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1978, Ser. No. 946,123

Claims priority, application Japan, Oct. 5, 1977, 52-134165[U]

Int. Cl.[2] A44B *19/00*

U.S. Cl. 24—205.16 C **4 Claims**



1. A slide fastener stringer comprising:

(a) a stringer tape having a pair of opposite surfaces along its one longitudinal edge;

(b) a series of fastener elements each having a pair of spaced legs disposed respectively on said surfaces and sandwiching said longitudinal edge therebetween; and

(c) sewing stitches securing said fastener elements to said stringer tape, said sewing stitches being composed of a needle thread and a looper thread, said needle thread extending across and over those element legs which lie on one of said tape surfaces, said looper thread including loops passing through said tape and extending between adjacent elements, said loops being interlooped with said needle thread at said one tape surface, said looper thread further including loops extending across and over those element legs which lie on the other tape surface and interlaced with said first-named loops at said other tape surface.

4,182,008

BUCKLE FOR A SAFETY BELT

René Pouget, Levallois-Perret, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Apr. 26, 1977, Ser. No. 791,075

Claims priority, application France, Apr. 28, 1976, 76 12529; Feb. 9, 1977, 77 03675

Int. Cl.[2] A44B *11/25*

U.S. Cl. 24—230 A **7 Claims**

1. A safety belt buckle for an automotive vehicle comprising in combination:

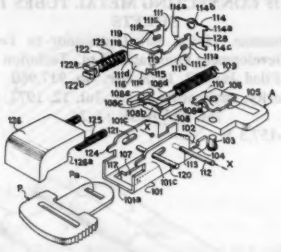
a support member, said support member defining a substantially rectilinear slideway which is adapted for receiving through one end portion thereof a bolt member having an aperture therein, said slideway having a plane in which said bolt member moves;

a locking member, said locking member being pivotally mounted on said support member, said locking member including a tongue member for securing said bolt member to said buckle in the locked position, said tongue member having a first abutment surface in contact with said bolt member in said aperture, said first abutment surface being substantially parallel to the direction of pivoting of said locking member, said tongue member being generally

perpendicular to the plane of said slideway in the locked position;

means for causing said locking member to pivot upon insertion of said bolt member to move said tongue member into said aperture of said bolt member;

a stop member, said stop member being slidably mounted on said support member, said stop member being positioned to engage a second abutment surface of said locking member to restrain movement of said locking member in the



locked position, said second abutment surface being substantially parallel to the plane of said slideway in said locked position;

a first spring, for urging said stop member into position against said second abutment surface; and

a control member, said control member being operatively positioned to move said stop member out of engagement with said second abutment surface to permit said locking member to pivot so as to move said tongue member out of said aperture in said bolt member.

4,182,009

ELECTRICAL IGNITERS

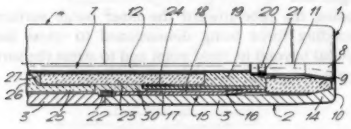
Ronald H. Cooper, Claygate; Kenneth A. Goreham, London, and Christopher B. Wakeford, Twickenham, all of England, assignors to Smiths Industries Limited, London, England

Filed Mar. 10, 1978, Ser. No. 885,246

Claims priority, application United Kingdom, Mar. 11, 1977, 10398/77

Int. Cl.[2] H01T *21/02*

U.S. Cl. 29—25.12 **12 Claims**



1. A method of forming an electrical igniter comprising the steps of:

(a) forming a first electrode including a rod-shaped portion;

(b) forming a second electrode in the form of an outer shell of said igniter;

(c) mounting said rod-shaped portion to extend coaxially within said outer shell with said first and second electrodes being separated from one another by an electrical discharge path;

(d) forming a tubular assembly by positioning an inner tube to extend coaxially within an outer tube and joining said inner tube to said outer tube at one end only, with said inner tube and said outer tube separated from one another along a part of their length; and

(e) forming a seal between said first and second electrodes by positioning said tubular assembly to extend coaxially within said outer shell, sealing an end of said outer tube remote from said one end with said outer shell, and forming a seal of glass material between the inner surface of said inner tube and the surface of said rod-shaped portion of said first electrode.

4,182,010

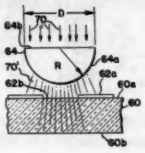
ELECTRON BEAM MATRIX DEFLECTOR MANUFACTURED BY ETCHING DIVERGENT SLOTS

Charles Q. Lemmond, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,902

Int. Cl.[2] H01J *9/14*

U.S. Cl. 29—25.18 **2 Claims**



1. A method for forming an electron-beam matrix deflection member, comprising the steps of:

(a) providing a blank of a photosensitive insulating material, said blank having first and second substantially parallel surfaces;

(b) masking the first surface of said blank with a pattern of parallel lines, each line defining one of a plurality of spaced parallel bars having aligned opposed ends;

(c) masking areas at each of the opposed ends of the first member surface outwardly adjacent the ends of the bar-defining mask pattern to form a pair of insulated end supports;

(d) exposing the masked first surface of the blank to a plurality of diverging beams of photons of a wavelength to which said material is photosensitive, each of said plurality of beams diverging toward said second blank surface through one of a plurality of slots formed between a pair of adjacent bar-defining portions of the mask pattern on said first blank surface;

(e) developing the blank after exposure to etch a plurality of parallel slots each hvaing a continuously diverging cross-section therethrough from said first to said second surfaces, with each slot formed between a pair of said plurality of said parallel, spaced bars with all bars integrally joined, at each opposed end thereof, to one of the pair of insulated end support portions of said blank; and

(f) coating at least a portion of each of said bars with a conductive material to form an electrode upon each opposed side of each slot.

4,182,011

METHOD FOR INSTALLING A BEARING IN A UNIVERSAL COUPLING

Reinhard Bretzger, Gerstetten-Dettingen; Fritz Kienle, Königsbronn-Zang, and Hans Lindenthal, Heidenheim-Mergelstetten, all of Fed. Rep. of Germany, assignors to Voith Transmit GmbH, Mulheim, Fed. Rep. of Germany

Filed May 5, 1978, Ser. No. 903,053

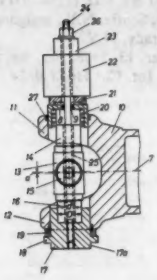
Int. Cl.[2] B21H *1/14*; B21K *1/02*; B23P *19/02*

U.S. Cl. 29—148.4 A **6 Claims**

1. A method of assembling a coupling fork of a universal coupling of the type comprised of two coupling forks, wherein the coupling fork is a single piece unit having two fork eyes, and the coupling includes a crosspiece having four pins, and each pair of crosspiece pins being on a respective axis, and the crosspiece having a bore therein which extends along the axis of a pair of the pins; the method being for mounting a bearing having a bearing sleeve for pivotally supporting a pin of the

crosspiece of the coupling, and the pin being mounted in the bearing sleeve in the fork eye; the method comprising:

inserting a tie rod in the bore in the crosspiece and extending along the axis of the pair of the pins; supporting the tie rod in a fixed position one fork eye, while passing the tie rod



through a bore which passes through the bearing sleeve for the bearing at the other fork eye to align the pin therein;

then pressing the bearing sleeve, through which the tie rod passes, into an opening provided therefor in the other fork eye and about the pin therein.

4,182,012

METHOD OF MAKING A PISTON WITH A GUDGEON PIN

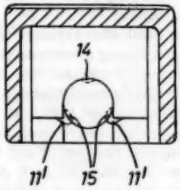
Albert Block, Glucksburg, Fed. Rep. of Germany, assignor to Danfoss A/S, Nordborg, Denmark

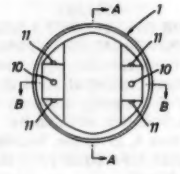
Division of Ser. No. 738,712, Nov. 4, 1976, Pat. No. 4,095,513. This application Dec. 5, 1977, Ser. No. 857,771

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1975, 2549550

Int. Cl.[2] B23P *15/10, 11/00*

U.S. Cl. 29—156.5 A **2 Claims**





1. A method of making a piston assembly for compressors comprising the steps of molding a piston body having a circumferentially uninterrupted cylindrically shaped surface portion with two spaced apart downwardly open U-shaped grooves each formed with a curved summit and parallel sidewalls interiorly of said surface portion, said sidewalls being parallel to the axis of said piston body and said grooves being formed with pimples near lower edges of said side walls, press fitting a connecting rod pin into said grooves by moving the pin parallel to the axis of the piston, and transforming the shapes of said pimples to press against said pin to provide sole means in absence of any other means for fastening said connecting rod pin to said piston body.

4,182,013

METHOD OF CONNECTING METAL TUBES TO METAL SHEETS

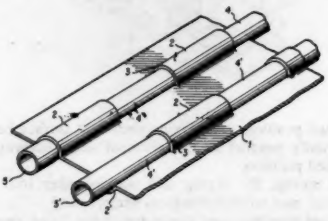
Gershon Grossman, Haifa, Israel, assignor to Technion Research & Development Foundation Ltd., Technion City, Israel

Filed Jun. 22, 1978, Ser. No. 917,960

Claims priority, application Israel, Jul. 12, 1977, 52508

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.3 V **8 Claims**



1. A method of connecting at least one straight metal tube to a flat metal sheet along a predetermined axis, comprising the steps of:

slotting the sheet by a plurality of spaced-apart, parallel cuts symmetrical in respect of, and perpendicular to, the said axis, said cuts being of a length not less than the outside diameter of the tube,

deforming the sheet by pressing the areas between each two consecutive cuts so as to form semicylindrical bulges along the axis alternately projecting out of the sheet plane in opposite directions, said bulges having a concave semicircular cross-section slightly larger than the outer diameter of the said tube,

inserting said tube into the space formed by said alternate bulges, and

expanding the tube toward the inner bulge surfaces, the expanding force being dimensioned to stress the tube material beyond its yield point and to stress the surrounding sheet material below its elastic limit.

4,182,014

METHOD OF MAKING A SPACER-EXPANDER SPRING FOR A PISTON RING ASSEMBLY

George J. Anderson, Hagerstown, and Roscoe L. Bell, Springport, both of Ind., assignors to Dana Corporation, Toledo, Ohio

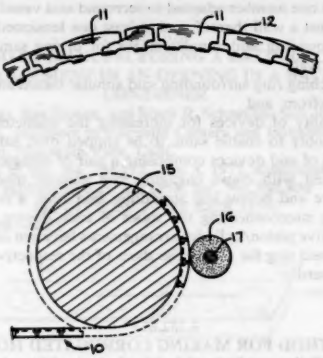
Division of Ser. No. 736,676, Oct. 28, 1976, Pat. No. 4,108,448. This application Mar. 20, 1978, Ser. No. 888,119

Int. Cl.[2] B21F *35/04*

U.S. Cl. 29—173 **8 Claims**

1. A method of forming an expansion spring for use in a piston ring assembly having an outer ring for engagement with an engine cylinder wall, said outer ring defining an annular recess of a first diameter for receiving said spring, said method comprising perforating an elongate metallic strip including periodic cuts to each lateral edge thereof; forming said strip into a generally U shaped configuration; rolling the U shaped member so formed on a mandrel of smaller diameter than said

first diameter with the base of said U adjacent said mandrel and the legs of said U extending radially outwardly therefrom; and



machining said spring while on said mandrel to a uniform outer diameter smaller than said first diameter.

4,182,015

WIRE CLOSURE CLIP

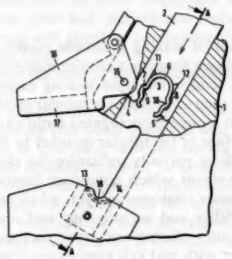
Herbert Niedecker, Am Ellerhang 6, Königstein, Fed. Rep. of Germany (6240)

Filed Mar. 2, 1978, Ser. No. 882,823

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710210

Int. Cl.² B23P *11/00*

U.S. Cl. 29—243.56 **2 Claims**



1. In combination, a bar of clips each adapted to close a tubular wrapper, bag or the like, and a closing device for each clip, each clip consisting essentially of a curved U-shaped length of metal wire, the legs of the clip being curved inwardly toward one another at the ends thereof and each including an outwardly directed portion on each leg, the closing device including a clip guideway and comprising means for advancing said bar toward said guideway, a die for a clip in said guideway, and a retractable punch for advancing a clip in said guideway toward said die and thereby to close around the gathered wrapper, said punch having a pair of side portions with respective outwardly directed arcuate portions for receiving the outwardly directed portions of said legs of the clip, whereby upon retraction of said punch if the clip is not closed it will be retracted with said punch so as not to permit the next clip of said bar to be advanced toward said guideway.

4,182,016

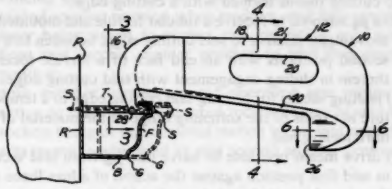
GUTTER SPIKE REMOVER

Douglas G. Break, 30262 Astor Rd., Farmington, Mich. 48024

Filed May 24, 1978, Ser. No. 909,299

Int. Cl.² B25B *27/00*; B25C *11/00*

U.S. Cl. 29—275 **3 Claims**



1. A gutter spike remover for withdrawing from a building wall the supporting spike and tubular spacer therearound of a gutter, said remover comprising

a horizontal frame member having an elongated intermediate portion with a depending forward arm and a depending rearward arm disposed in horizontally-spaced relationship along said intermediate portion in downwardly-offset relationship to said intermediate portion,

and a forwardly-facing hammer blow impact abutment disposed on said rearward arm and extending below the lower end of said forward arm,

said forward arm having a slot therethrough with an open lower end,

said slot extending upward from the lower end of said forward arm and dividing said forward arm into a pair of laterally-spaced spike-extracting fingers.

4,182,017

METHOD AND APPARATUS FOR TERMINATING OPTICAL FIBRES

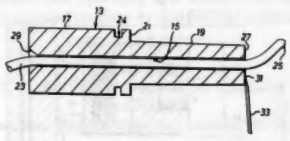
Mark W. Ford, Barnhurst, and Thomas B. Wearden, Bromley, both of England, assignors to Lee Green Precision Industries Ltd., London, England

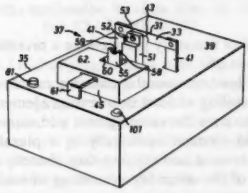
Filed Mar. 22, 1978, Ser. No. 889,086

Claims priority, application United Kingdom, Mar. 24, 1977, 12533/77

Int. Cl.² B23P *19/00*

U.S. Cl. 29—428 **10 Claims**





1. A method of terminating optical fibre means comprising the steps of:

(a) threading the optical fibre means through a tubular ferrule so that said fibre means projects from an end face of said ferrule;

(b) heating the cutting edge of cutting means to a temperature in excess of the softening range of the material of said optical fibre means; and

(c) sweeping the said cutting edge across the said end face and in engagement therewith to sever said fibre means substantially flush with said end face.

5. Apparatus for terminating optical fibre means comprising:

(a) cutting means formed with a cutting edge;

(b) a jig adapted to receive a tubular ferrule and mounted for movement, relative to said cutting edge, between first and second positions with an end face of a ferrule received therein in sliding engagement with said cutting edge;

(c) heating means for heating said cutting edge to a temperature in excess of the softening range of the material of the fibre means; and

(d) drive means operable to move said jig from said second to said first position against the action of a bias force and then to release said jig to permit said jig to return to said second position whereby in use to sweep said cutting edge across the end face of the ferrule received in said jig.

4,182,018

METHOD OF AND APPARATUS FOR THE STRESSING OF PRESSURE VESSELS

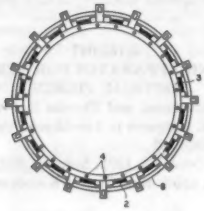
Lothar Gülicher, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to Siempelkamp Giesserei GmbH & Co., Krefeld, Fed. Rep. of Germany

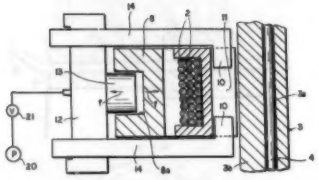
Filed Apr. 7, 1978, Ser. No. 894,374

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2716020

Int. Cl.[2] B23P *11/02, 19/04;* B66F *3/24*

U.S. Cl. 29—446 **10 Claims**





1. A method of inwardly prestressing a pressure vessel comprising the steps of:

disposing at least one annular stressing member on a support ring and coiling at least one tension element around said member to stess the same against said support ring;

drawing said element outwardly at a plurality of spaced locations around said support ring, thereby increasing the diameter of the assembly consisting of said member and said element;

while maintaining the increased diameter of said assembly, slipping same over said pressure vessel; and

releasing the outward force on said element, thereby forcing said member against said vessel to apply inward prestress thereto.

3. An apparatus for prestressing a cylindrical pressure vessel comprising:

a stressing assembly comprising annular means including at least one member adapted to surround said vessel and bear against a wall thereof, and at least one tensioned element surrounding said annular means for urging same against said wall;

a stretching ring surrounding said annular means and spaced therefrom; and

a plurality of devices for increasing the diameter of said assembly to enable same to be slipped over said vessel, each of said devices comprising a pair of elongated shoes formed with claws engaging said annular means from above and below and straddling said ring, a respective yoke interconnecting the shoes of each device, and respective piston/cylinder arrangements between each yoke and said ring for urging the shoes of the respective device outwardly.

4,182,019

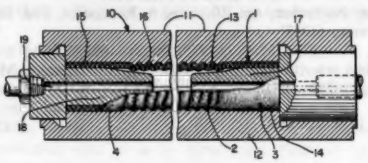
METHOD FOR MAKING CORRUGATED HOSE

David N. Tally, and Richard L. Marsh, both of Lincoln, Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 504,228, Sep. 9, 1974, abandoned, which is a continuation of Ser. No. 353,151, Apr. 20, 1973, abandoned, which is a continuation of Ser. No. 166,138, Jul. 26, 1971, abandoned. This application Feb. 27, 1978, Ser. No. 881,342

Int. Cl.[2] B23P *11/02;* B29C *17/07;* B29D *23/18*

U.S. Cl. 29—453 **11 Claims**



1. In a method of making a flexible reinforced corrugated hose which includes forming a tubular member of elastomeric material with a reinforcing layer lacking extensibility embedded therein and then subjecting the tubular member to heat and fluid pressure in a closed, corrugated mold cavity to conform the external surface of the tubular member to the mold configuration and at least partially vulcanize the elastomeric material, the improvement which comprises forming said tubular member of an inner elastomeric layer, a knit reinforcing layer lacking extensibility and surrounding said inner elastomeric layer, and an outer elastomeric layer surrounding said knit reinforcing layer with said knit reinforcing layer having openings therein whereby said inner and outer elastomeric layers are interbonded by the passage of the elastomeric material of said layers through the openings in the knit reinforcing layer during vulcanization or partial vulcanization of the elastomeric material and maintaining said knit reinforcing layer in a relaxed, essentially unstretched condition during vulcanization or partial vulcanization of the elastomeric material and preventing any substantial expansion of the tubular member by forming said tubular member with an outside diameter from about 94% to slightly over 100% of the maximum diameter of the mode corrugations whereby during such vulcanization or partial vulcanization the mold engages the external surface of the tubular member to depress the same inwardly in localized areas with the knit reinforcing layer being free floating and assuming the corrugated configuration of the mold to permit the formation of deep internal corrugations in the tubular member of substantially the same depth as that of the mold corrugations whereby a subsequently inserted spiral wire rein-

forcement of a diameter to fit snugly in the troughs of the internal corrugations is retained in position in the internal corrugations.

4,182,020

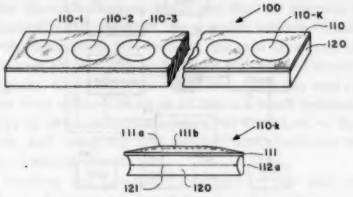
METHOD OF MANUFACTURING A BATTERY COVER FOR PLACEMENT IN AN OPENING IN A BATTERY CONTAINER

Len Molloy, San Ramon, and Mark R. Schneider, San Jose, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Division of Ser. No. 754,212, Jan. 3, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 896,836

Int. Cl.[2] B23P *19/00;* **B32B** *31/00*

U.S. Cl. 29—469.5 **3 Claims**



1. The method of manufacturing a battery cover suitable for placement in an opening in a battery container through which a battery can be inserted or withdrawn from said container, to maintain a battery in position and to prevent unwanted materials from entering said battery container, said cover comprising a metal plate having a shape conforming to the profile of the battery, and a resilient disc of material adherent to said metal plate, the outer edge of said resilient material being adapted to be in pressing contact with the internal edge of the opening in the battery container, thereby to firmly anchor said cover in said opening, to provide a water-resistant seal with said opening, and to firmly engage an enclosed battery, said cover being adapted to fit in said opening in such a manner that said metal plate rests above the exposed surface of said battery container by an amount sufficient to allow fingernails to be inserted between said metal plate and said exposed surface for removing said cover from said opening, comprising the steps of:

forming a metal strip;

joining a resilient material to said metal strip by means of an adhesive; and

stamping said cover from said strip, thereby to provide a cover comprising said metal plate and said resilient material adherent to said plate, wherein, during said stamping process, said resilient material is compressed, thereby expanding lateral dimensions of the compressed material such that when the stamp cuts the compresed resilient material and said resilient material returns to its normal thickness, a natural concavity is formed in the edge of said resilient material.

4,182,021

TOOL MAGAZINE WITH A TOOL REMOVAL DEVICE

Kiyotaka Kato, Nishio, and Tadahiko Ohya, Nagoya, both of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan

Filed May 16, 1978, Ser. No. 906,591

Claims priority, application Japan, May 19, 1977, 5264452

Int. Cl.[2] B23Q *3/155*

U.S. Cl. 29—568 **9 Claims**

1. A tool magazine with a tool removal device comprising:

a magazine frame;

a plurality of tool sockets each capable of removably receiving a tool;

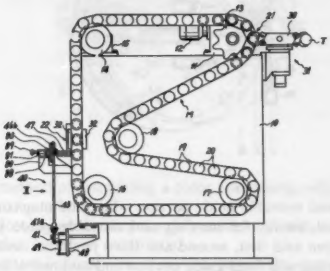
socket support means indexably mounted on said magazine frame for carrying said plurality of said tool sockets;

indexing means for indexing said socket support means so as to present to a removal station one of said tool sockets receiving a desired tool;

operating arm means pivotably carried on said magazine frame for pivotal movement between first and second angular positions;

a foot-operated lever pivotably carried on said magazine frame and linked with said operating arm means for advancing the same from said first angular position to said second angular position when trodden, said foot-operated lever being urged to retract said operating arm means from said second angular position to said first angular position;

a push member carried on said operating arm means for acting to push out said desired tool from one of said tool sockets being at said removal station when said operating arm means is advanced to said second angular position;



a locking member axially movable in a direction perpendicular to a plane within which said operating arm means is pivotally moved and capable of entering into a locking position to lock said operating arm means each time the same is retracted to said first angular position;

urging means for urging said locking member to move toward said locking position;

holding means for holding said locking member at an unlocking position distanced from said locking position after said locking member is manually moved from said locking position to said unlocking position against said urging means; and

release means cooperable with said locking means for releasing said locking member from holding by said holding means when said operating arm means is advanced from said first angular position to said second angular position.

4,182,022

DEVICE FOR TOOL CHANGING IN PUNCHING MACHINES

Erik Kristiansson, Partille, Sweden, assignor to Pullmax AB, Sweden

Filed Jun. 16, 1978, Ser. No. 916,054

Claims priority, application Sweden, Jun. 21, 1977, 7707201

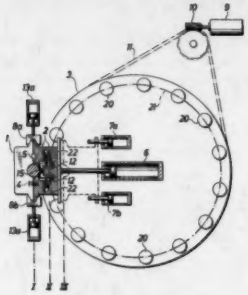
Int. Cl.[2] B23Q *3/155*

U.S. Cl. 29—568 **11 Claims**

1. Apparatus for changing tools in punching machines, especially turret presses, comprising concentric upper and lower rotatable turret magazines one above the other, a plurality of pairs of tools carried by said magazines with axes of said tools disposed on concentric pitch circles of said magazines, each of said pairs of tools comprising a punch carried by one of said magazines and a mating die carried by the other of said magazines, and guide means for successively moving said tools from said magazines to an operating position, guiding said tools in said operating position and returning said tools to said magazines, said guiding means comprising:

a fixed guide portion outside said pitch circle of said magazines and having a guide surface for a tool, a movable

guide portion having a guide surface for said tool, said movable guide portion being movable radially of said magazines between a first operating position in engagement with said fixed guide portion, a second changing position in which the axis of said guide surface of said movable guide portion intersects the pitch circles of said magazines and a third neutral position on the inside of said pitch circles of said magazines to allow tools carried by said magazines to pass between said fixed guide portion



and said movable guide portion when said magazines are rotated, means for moving said movable guide portion between said first, second and third positions, means for clamping said fixed guide portion and said movable guide portion together when said movable guide portion is in said first position, and means for retaining said tool in said movable guide portion during movement of said movable guide portion from said first position to said second position.

4,182,023

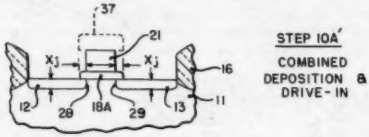
PROCESS FOR MINIMUM OVERLAP SILICON GATE DEVICES

Jerome Cohen, Centerville, Ohio, and Peter C. Chen, Sunnyvale, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 21, 1977, Ser. No. 844,325

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 **33 Claims**



1. In a process using a semiconductor substrate having a layer of silicon thereon to form a semiconductor device having a silicon electrode adjacent an impurity region in the substrate, the improvement wherein the boundary of the silicon electrode is aligned with the boundary of the impurity region by the process of forming the impurity region and comprising:

forming on the silicon layer a masking layer providing a masked region having a first boundary;

forming from the silicon layer the silicon electrode having a second boundary spaced along the substrate from the first boundary and within the masked region; and

doping the substrate with impurities according to a preselected doping method to form the impurity region with an attendant boundary controlled by the first boundary and aligned with the second boundary, the distance between the boundaries being prearranged to correspond to the amount of lateral movement of the impurities inherent in the preselected doping method.

4,182,024

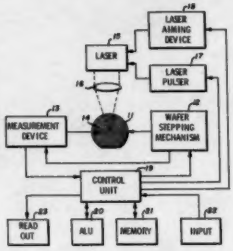
AUTOMATIC CONTROL OF INTEGRATED CIRCUIT TRIMMING

Robert A. Cometta, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 15, 1977, Ser. No. 860,927

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 **9 Claims**



1. A process for trimming a junction field effect transistor component in a monolithic integrated circuit to obtain a controlled electrical parameter having a desired magnitude in the completed integrated circuit, said process comprising the steps:

energizing said integrated circuit;

measuring a selected parameter to be controlled in said circuit;

determining a trimmable junction field effect transistor in said circuit which, if subjected to radiant energy, would vary the operation of said circuit in a direction that would tend to establish said desired magnitude of said selected parameter;

subjecting the channel region of said junction field effect transistor to a predetermined controlled quantity of radiant energy;

remeasuring said selected parameter; and

repeating said subjecting and remeasuring steps until said remeasuring step indicates that said selected parameter is within said desired magnitude.

4,182,025

MANUFACTURE OF ELECTROLUMINESCENT DISPLAY DEVICES

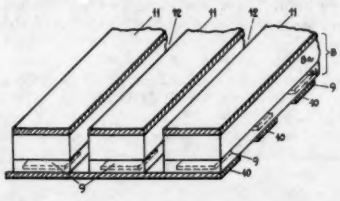
Dennis K. Wickenden, London, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Filed Sep. 28, 1977, Ser. No. 837,611

Claims priority, application United Kingdom, Oct. 7, 1976, 41744/76

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—577 R **3 Claims**



1. A process for the manufacture of a high resolution monolithic array of light-emitting semiconductor diodes, for use in

an eletroluminescent display device, which includes the steps of

(A) providing a slice of n-type semiconductor material,

(B) forming a plurality of discrete regions of p-type semiconductor material on one surface of said slice by diffusion of p-type material into said surface, to delineate individual diode areas,

(C) simultaneously forming individual electrodes on the surfaces of said regions of p-type material and connecting said electrodes together in groups by forming continuous metal strips overlying groups of said p-type regions,

(D) forming a continuous electrode layer, common to all the diode areas, over substantially the whole of the opposite, wholly n-type, surface of the said slice,

(E) for electrically isolating adjacent portions of the array from one another as required, forming a plurality of isolation channels each of width less than 50 microns by mechanically cutting from the exposed surface of said common electrode layer, through the said layer and through the said slice of n-type material between adjacent p-type regions, to within a short distance from the said continuous strip electrodes so as to leave a small residual thickness of semiconductor material at the bases of the channels, and removing said residual semiconductor material by chemical means, and

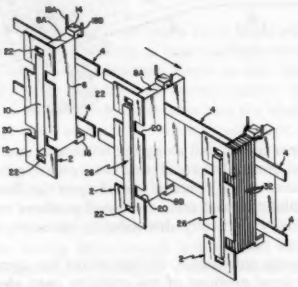
(F) bonding the remaining portions of the said common electrode layer to a metallized surface of an insulating substrate plate.

4,182,026

ELECTRIC MOTOR MANUFACTURE

Robert F. Searle, Amherst, N.H., assignor to Vibrac Corporation, Amherst, N.H.

Filed Aug. 17, 1977, Ser. No. 825,207
Int. Cl.² H02K *15/02*
U.S. Cl. 29—596 **5 Claims**



1. A method of making stator assemblies for electric motors comprising the steps of:

(1) providing a molded strip comprising a series of hollow bobbins connected by at least one stringer and having terminal pins associated with each bobbin;

(2) conducting first one and then the other of the following steps in the order recited or the reverse order: (a) inserting a pole piece of a magnetic material into each bobbin and (b) winding at least one coil on each bobbin and connecting the ends of said coils to said terminal pins;

(3) inserting at least a portion of said strip into a hollow casing which is made of a magnetic material and has a series of internal slots, so that a plurality of bobbins are arranged in a symmetrical array about a selected axis and so that a first end of each of said pole pieces resides in one of said slots and engages said casing; and

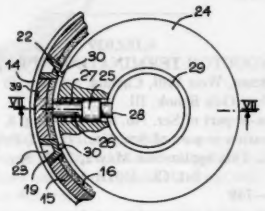
(4) conducting first one and then the other of the following steps in the order named or in the reverse order: (a) connecting terminal connecting means to said terminal pins and (b) securing said at least a portion of said strip to said housing.

4,182,027

METHOD OF ASSEMBLING A MAGNETO ROTOR ASSEMBLY

Jacques Benezech, Le Vesinet, France, assignor to Novi-P.B., Pantin, France

Filed Mar. 6, 1978, Ser. No. 883,579
Claims priority, application France, Mar. 29, 1977, 77 09288
Int. Cl.² H02K *15/02*
U.S. Cl. 29—598 **3 Claims**



1. A method of assembling a rotor comprising when assembled:

a hollow drum having a substantially cylindrical interior surface centered on an axis,

a predetermined number of discrete segmental magnets lying on said surface inside said drum and angularly equispaced about said axis,

a like number of magnetically permeable pole pieces each of the same angular dimension as a respective magnet and each lying radially inside a respective magnet, and

a like number of nonmagnetic holding blocks interleaved between said magnets and pole pieces and each having a radial dimention substantially greater than the radial dimension of the respective magnets, said pole pieces being substantially harder than said blocks,

said method comprising the steps of sequentially:

positively positioning said holding blocks in said drum at angularly equispaced locations;

axially fitting said magnets into said drum between said holding blocks;

axially sliding said pole pieces between said holding blocks and radially inside said magnets while simultaneously radially outwardly pressing said pole pieces against said magnets so that said pole pieces dig into said holding blocks.

4,182,028

HERMETICALLY SEALED BUTTON-TYPE ELECTROCHEMICAL CELL AND METHOD FOR MAKING SAME

James Epstein, Sharon, and Nikola Marincic, Winchester, both of Mass., assignors to GTE Laboratories Inc., Waltham, Mass.

Division of Ser. No. 711,039, Aug. 2, 1976, abandoned. This application Jan. 18, 1978, Ser. No. 870,429
Int. Cl.² H01M *6/00, 6/32*
U.S. Cl. 29—623.2 **8 Claims**

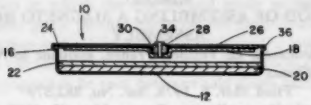
1. A method for producing a hermetically sealed cell from elements including a mating metallic can and metallic cover comprising the steps of:

(a) forming a peripheral fill port in either of said elements;

(b) assembling all dry, non-electrolytic components within said elements;

(c) welding said can to said cover, without obstructing said fill port, to substantially hermetically seal said can to said cover;

(d) filling the space enclosed by said can and said cover through the fill port with an effective quantity of electrolyte; and



(e) welding the fill port closed to hermetically seal the enclosed cell.

4,182,029

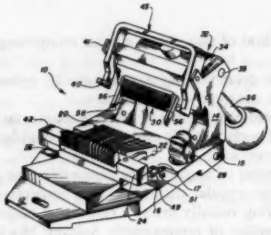
CONDUCTOR TERMINATING APPARATUS

John P. Nijman, West Hill, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 831,470, Aug. 8, 1977, which is a continuation-in-part of Ser. No. 772,222, Feb. 25, 1977, abandoned. This application May 1, 1978, Ser. No. 901,947

Int. Cl.[2] H01R *43/04*

U.S. Cl. 29—749 **18 Claims**



1. Apparatus for simultaneously terminating a plurality of insulated conductors in the contact members of an electrical connector, comprising:

a base including means for supporting the connector in conductor-receiving position;

a carriage pivotally attached to said base and movable between an open position wherein said carriage is remote from said connector and an operating position wherein said carriage is adjacent said connector;

an insertion tool mounted for reciprocal movement in said carriage and including means for engaging and pressing said conductors into respective contact members of the connector when said carriage is in said operating position to thereby terminate said conductors in said respective contact members;

rotatable cam means mounted on said carriage for moving said insertion tool into and out of conductor-terminating engagement with said connector, said cam means including cam actuating means for rotating said cam means; and

latch means for retaining said carriage in said operating position and including means coacting with said cam actuating means for automatically locking and unlocking said latch means.

4,182,030

APPARATUS FOR FEEDING AND CRIMPING ELECTRICAL CONTACTS

Jerry M. Mullins, Arlington, Tex., assignor to Vought Corporation, Dallas, Tex.

Filed Jun. 30, 1977, Ser. No. 811,515

Int. Cl.[2] H01R *43/04*

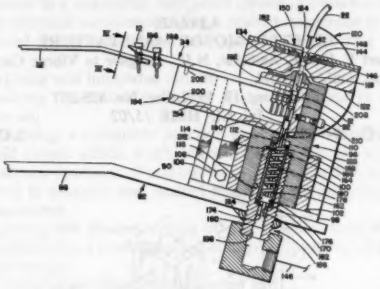
U.S. Cl. 29—753 **6 Claims**

1. A crimping machine for serially advancing, feeding, and crimping electrical contacts of a type having a ferrule head portion and an elongated portion of smaller diameter than the head portion, the head portion defining upper and lower, peripherally extending support surfaces adjacent its periphery and facing the elongated portion, the center of gravity of the contacts lying between the lower support surface and the distal end of the elongated portion, the apparatus comprising:

an annular hopper having a peripheral sidewall portion and a spiral pathway extending upwardly from the floor of the hopper to the sidewall, an outlet being formed through the sidewall adjacent and communicating with the spiral pathway;

a first track structure, having first and second parallel rails spaced apart to engage mutually opposite portions of the lower support surfaces of the electrical contacts, the first track having a proximate end portion connected to the hopper adjacent the outlet and extending, substantially horizontally, tangentially from the outlet, and a second portion having a downward inclination which is insufficient to permit sliding movement of the contacts therealong absent vibratory movement of the track structure, the first track structure comprising a means for slideably engaging the lower, contact support surfaces on opposite sides of the contacts and for permitting movement therealong in response to vibration of the first track structure;

vibratory means connected to the hopper for inducing vibratory movement of the hopper and of the first track structure for causing electrical contacts within the hopper to pass upwardly along the spiral pathway, through the



hopper outlet, and along the horizontal and inclined portions of the first track structure with the lower support surfaces of the contacts seated upon the first and second parallel rails and their elongated portions extending substantially vertically downwardly between the first and second rails;

a crimping mechanism, having means for crimping the ferrule head portions of the contacts onto electrical wires inserted into the head portions;

feeding means for receiving the contacts and for sequentially feeding the electrical contacts into the crimping mechanism, the feeding means having an opening for receiving contacts to be fed to the crimping mechanism, and comprising a means for receiving the contacts in a substantially upright position and for imparting a longitudinal motion to the contacts as they are fed to the crimping mechanism;

a second track structure extending substantially parallel to the inclined portion of the first track structure and extending partially over the first track structure, the second track structure comprising a means for receiving contacts from the first track structure, for engaging the upper support surfaces of the contacts, and for serially passing the contacts through the opening of the feeding means; and

resonantly vibratory support means connected to the vibratory means, the feeding means and second track structure being mounted on the vibratory support means, the vibratory support means comprising means for supporting the

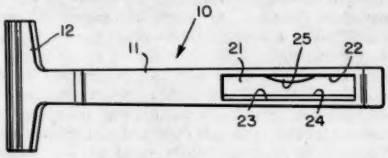
second track structure in alignment with the first track structure, and for orienting the second track structure with an inclination insufficient to permit sliding motion therealong of the contacts, the vibratory support means comprising means for inducing vibration of the second track structure for enhancing movement of the contacts therealong, the first and second track structures having respective distal end portions, in vertical alignment, which comprise means for transferring vibratory motion from the first to the second track structures through any electrical contacts which are vertically aligned with both the first and second track structures.

4,182,031

RAZOR WITH HANDLE TO STORE A BLADE UNIT OR CARTRIDGE

John Cecil, Jr., 25 Leitch Ave., Skaneateles, N.Y. 13152

Filed Feb. 10, 1978, Ser. No. 876,862
Int. Cl.[2] B26B *21/52*
U.S. Cl. 30—47 **5 Claims**



1. In a combination of a razor and a razor blade unit of the type having an elongate housing, at least one blade mounted on said housing, and recessed fastening means on one side of said housing releasably engageable with complementary means on the head of the razor for releasably attaching the blade unit in an operative position on the razor, an improved razor comprising

a head having thereon said complementary means for releasably attaching thereto said blade unit, and

an elongate handle integral at one end with said head and projecting transversely therefrom,

said handle having therethrough intermediate its ends an elongate aperture for releasably holding said blade unit in a stored position in said handle upon insertion of said unit downwardly into said aperture, said aperture being approximately equal in length to the length of said blade unit, and having opposed, generally parallel sidewalls separated from each other a distance approximately equal to the width of said blade unit housing,

a first projection integral with one sidewall of said aperture and projecting into said aperture for engagement in a recess in said fastening means when the blade unit housing is stored in said handle, and

a second projection integral with the opposite sidewall of said aperture and projecting thereinto in spaced, generally confronting relation with said first projection to engage the side of said blade unit housing opposite said recess, thereby releasably to hold the blade unit seated in its stored position over said first projection,

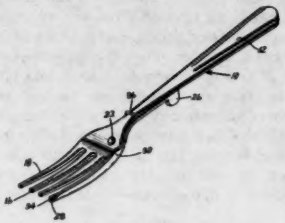
said aperture and projections being configured to allow insertion of said blade unit into said stored position only when said blade unit is disposed in a single, predetermined position relative to said projections.

4,182,032

COMBINATION FORK DEVICE

Duane B. Newport, 4611 Dodge, Fort Wayne, Ind. 46805

Filed Mar. 22, 1978, Ser. No. 889,098
Int. Cl.[2] A47J *43/28*
U.S. Cl. 30—137 **8 Claims**



1. A combination fork comprising:

a body having an elongated handle and plurality of generally parallel tines extending oppositely from said handle in a lengthwise direction:

said tines being spaced apart laterally across the width of said fork and having paralled upper surfaces which are adapted collectively to support a quantity of food, one of said tines being an outer tine which is adjacent to only one other tine;

an assist blade movably connected to said fork body and having a portion extending above the level of said tine upper surfaces;

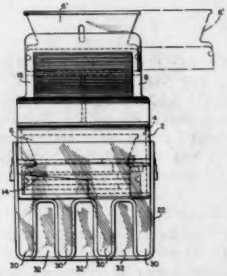
means for laterally moving said assist blade sideways from a first position removed from said outer tine to a second position wherein said blade is substantially contiguous with said outer tine along substantially its entire length, whereby a food quantity between said blade in said first position and said outer tine is moved laterally over said tine upper surfaces under the force of said blade portion as said blade is moved laterally to said second position.

4,182,033

SCRAPER ASSEMBLY

Chester F. Jacobson, Southboro, and Norman D. Poisson, Andover, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Apr. 7, 1978, Ser. No. 894,596
Int. Cl.[2] B26B *5/00*
U.S. Cl. 30—169 **4 Claims**



1. A scraper assembly comprising a housing having two generally parallel elongated sides interconnected by first and second ends and having a head portion adapted to receive and retain a blade unit, and a cover member adapted to cover said blade unit retained by said head portion, said cover member having two generally parallel elongated walls engageable with

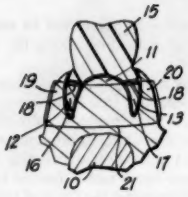
said sides respectively, and first and second end walls engageable with said ends respectively, said cover member and said head portion being provided with detent and recess means to facilitate engagement of said cover member and said head portion and to facilitate removal of said cover member from said head portion, said cover member being further adapted to cover portions of said housing remote from said head portion, said cover member being releasably retained by engagement with a second portion of said housing and completely separable therefrom, said cover member, when in engagement with said second portion of said housing remote from said blade unit being adapted to serve as a grip portion for said assembly, whereby said cover member may be selectively positioned to cover said blade unit and may be removed therefrom and positioned on said housing remote from said blade unit to expose said blade unit for scraping operations, and may be completely removed from the remainder of said assembly.

4,182,034

PERMANENT DENTURE PLATES AND METHOD OF INSTALLING

Margaret McCauley, 314 Alfred Ave., Rome, Ga. 30161

Filed Sep. 8, 1977, Ser. No. 831,370
Int. Cl.[2] A61C *13/00*
U.S. Cl. 433—174 **4 Claims**



1. A method of permanently installing a denture plate having laterally spaced skirt portions and said plate being provided with suture openings in spaced relation along the dental arch comprising the steps of incising a toothless gum along two spaced incision lines following the dental arch, inserting the skirt portions of said plate into said incisions until the skirt portions are substantially embedded in the gum and the plate is firmly seated against the gum, and then passing loops of dissolvable suture material through said openings and through the natural gum transversely.

4,182,035

ADHESIVE COMPOSITIONS FOR THE HARD TISSUES OF THE HUMAN BODY

Junichi Yamauchi, Kurashiki; Kunitake Yamada, Kagamihara, and Kyoichiro Shibatani, Kurashiki, all of Japan, assignors to Kuraray Company Limited, Kurashiki, Japan

Filed Aug. 31, 1977, Ser. No. 829,486
Claims priority, application Japan, Aug. 31, 1976, 51-104772
Int. Cl.[2] A61K *5/06*
U.S. Cl. 433—228 **9 Claims**

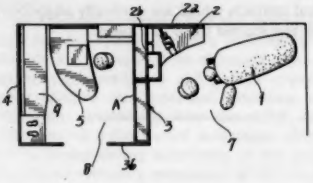
1. A packaged adhesive composition for bonding a dental filling material to the tooth, comprising two independent packages, the content of which may be admixed in use wherein said adhesive composition comprises a radical-polymerizable monomer (1), a diacyl peroxide (2), a secondary or tertiary amine attached to an aryl group (3) and an alkali or alkaline earth metal salt of an arylsulfinic acid (4), wherein one of said packages contains components (1) and (2), while the other package contains components (3) and (4), which are dissolved in a volatile solvent.

4,182,036

ORTHODONTIC UNIT DISPOSITION STRUCTURE

Yasuyuki Tada, Takatsuki, and Yutaka Ohta, Kyoto, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Feb. 28, 1978, Ser. No. 882,196
Claims priority, application Japan, Feb. 28, 1977, 52/021868
Int. Cl.[2] A61C *19/02*
U.S. Cl. 433—2 **2 Claims**



1. An orthodontic unit disposition structure, designed to be capable of carrying out an initial diagnosis and treatment and training of a patient in a clinical area and a consultation area, comprising:

a horizontal treatment table;

a cabinet substantially right-angled triangular in plane and arranged transversely diagonally to the head of said table and adapted to store orthodontic instruments and materials and having a worktable and sanitary parts provided on the top thereof;

a chest disposed in series with said cabinet and disposed transversely diagonally to the head of said treatment table;

a panel disposed substantially parallel with and spaced in an opposed relation from said chest and said cabinet; and

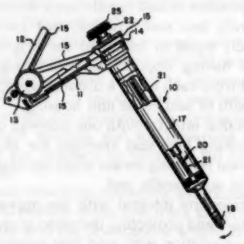
a desk disposed in substantially parallel space provided by said panel, said cabinet, and said chest, whereby treatment table, cabinet, chest, panel, and desk are installed on the floor and the floor having said treatment table placed thereon is used as the clinical area and the floor having said desk placed thereon is used as the consultation area.

4,182,037

HONING STONE ATTACHMENT FOR DENTAL HANDPIECE

Allen Ellman, 1 Auerbach La., Lawrence, N.Y. 11516, and Jon Garito, 22 Deering La., East Rockaway, N.Y. 11558

Filed Jun. 29, 1978, Ser. No. 920,321
Int. Cl.[2] A61C *1/08*
U.S. Cl. 433—110 **4 Claims**



1. A sharpening attachment for use with a low-speed dental handpiece having a chuck at one end operable by a threaded lock rod, comprising a straight rod having a lower threaded portion at one end adapted to engage the chuck and a knurled member at the opposite end for actuating the chuck, and an abrasive member secured to the knurled member, said rod

being adapted to mount within said dental handpiece for operative connection to and rotable with said chuck when the latter is driven.

4,182,038

DENTAL HANDPIECE

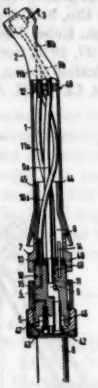
Ernst O. Fleer, Bensheim-Auerbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 21, 1976, Ser. No. 752,905

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2558064

Int. Cl.² A61C *1/10*

U.S. Cl. 433—85 7 Claims



7. In a dental handpiece having a connecting fitting for attachment to a supply hose having at least two agent supply lines, a head section having a compressed air drive motor, a grip portion extending between the fitting and the head section, and means for conveying at least two separate agents including compressed air from the supply hose into the head section, said means comprising a separate passage for each agent in the fitting, grip portion and head section, the improvements comprising said grip portion having a tubular sleeve portion being integral with the head section and receiving a passage for each agent therein; means for detachably connecting said grip portion to the connecting fitting and including a tubular member being connected to the fitting and being telescopically received in the sleeve portion with means providing relative rotation of the sleeve portion to the fitting so that the sleeve portion and each passage of the head section are rotatable relative to the fitting and each passage therein, said means for detachably connecting enabling removal of the integral grip portion and head section from the fitting without requiring any tools; each passage received in the sleeve portion being a flexible hose which is essentially freely arranged therein, each of the flexible hoses having one end rigidly attached to an end of the sleeve portion adjacent the head section and the other end attached to a passage in a centering piece, said centering piece having means coacting with the fitting to enable alignment of each passage of the centering piece with the respective passage in the fitting, said centering piece being held in engagement with a matching surface of the fitting as the grip portion is connected to the fitting by the detachable connecting means; and said connecting fitting including valve means for controlling flow of an agent in one of said passages, said valve including a sleeve rotatably mounted on said fitting so that relative rotation of the sleeve on the fitting changes the flow rate in said passage.

4,182,039

ARTICULATOR WITH BITE PLATE GUIDES

Giulio Preti, Str. Costalunga 10/2, Moncalieri, Italy

Filed Oct. 26, 1976, Ser. No. 735,342

Claims priority, application Italy, Oct. 31, 1975, 69693 A/75

Int. Cl.² A61C *11/00*

U.S. Cl. 433—54 5 Claims

1. A device for guiding and checking the fitting of teeth in total dental prostheses comprising an articulating device adapted to bear a plaster mold; a first base plate fixed to the articulating device; a second base plate fixed to the articulating device; a first bar member having a non-circular cross-section; first mounting means mounting the first bar member to extend substantially perpendicular to the first base plate while permitting rotation of the first bar member around the first bar member axis and fixing of the first bar member in any rotational position thereof; a first clamp adapted to hold a moldable transparent plate and mounted on the first bar member for sliding movement therealong without rotational movement of the first clamp relative to the first bar member, while permitting fixing of the first clamp at any position along the first bar member; a second bar member having a non-circular cross-section; second mounting means mounting the second bar member to extend substantially perpendicular to the second base plate while permitting rotation of the second bar member around the second bar member axis and fixing of the second bar member in any rotational position thereof; and a second clamp adapted to hold a moldable transparent plate and mounted on the second bar member for sliding movement therealong without rotational movement of the second clamp relative to the second bar member, while permitting fixing of the second clamp at any position along the second bar member.

4,182,040

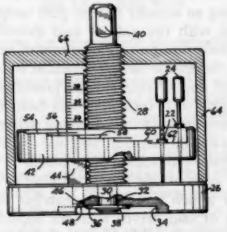
ENDODONTIC FILE HOLDER AND GAUGE

Edmund C. Bechtold, Jr., 1630 SW. Clay St., Portland, Oreg. 97201

Filed Feb. 21, 1978, Ser. No. 879,240

Int. Cl.² A61C *3/00*

U.S. Cl. 433—77 5 Claims



1. An endodontic file holder and gauge, comprising:

(a) a base,

(b) an elongated support screw mounted rotatably on the base and extending upwardly therefrom,

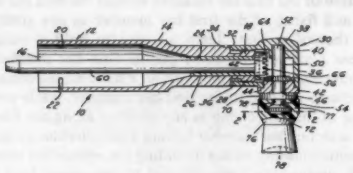
(c) a gauge plate provided with a central threaded hole receiving the threads of the screw, whereby the gauge plate is supported by the screw,
(d) the gauge plate being provided with a plurality of vertical openings therethrough for the removable reception of endodontic files,
(e) a portion of the gauge plate being provided with a plurality of downwardly stepped segments providing a plurality of upper surfaces each spaced a different distance downwardly from the upper surface of the remainder of the gauge plate, each stepped segment having a vertical opening therethrough for the removable reception of an endodontic file, and
(f) stop means interengaging the base and the gauge plate for preventing rotation of the plate while permitting movement of the plate in the longitudinal direction of the screw as the latter is rotated, whereby to vary the distance between the gauge plate and base.

4,182,041

DENTAL PROPHYLACTIC RIGHT ANGLE HAND PIECE

Howard W. Girard, Dearborn, Mich., assignor to Girard, Inc., Lisle, Ill.

Continuation of Ser. No. 753,035, Dec. 22, 1976, abandoned.
This application Aug. 24, 1978, Ser. No. 936,414
Int. Cl.[2] A61C *3/06*
U.S. Cl. 433—115 **1 Claim**



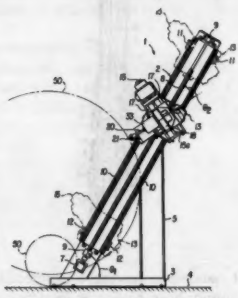
1. A dental prophylactic right angle hand piece comprising: an elongated tubular shank having an inner end and an outer end, and a bore extending axially therethrough, said bore having inner and outer axially directed ends respectively at said inner and outer ends of said shank, said outer end of said shank being threaded, a hollow head provided with an internally threaded sleeve for threadedly securing said head to the threaded outer end of said shank, said head having side walls and a pair of opposite end walls, an elongated driven member rotatably supported within said head about an axis perpendicular to the axis of said shank, said driven member including a portion extending through one of the end walls of said head, an elongated driving spindle rotatably supported within the bore of said shank coaxial therewith and having a terminal end portion extending beyond the outer end of said bore, said spindle and said driven member including driving means integral with said spindle and driven means integral with said driven member in driving relation to each other, said driven means comprising an annular row of gear teeth on said driven member coaxial with the axis of said driven member, said driving means comprising an annular row of gear teeth on said spindle coaxial therewith having terminal outer end portions around the outer end of said spindle positioned between the annular row of gear teeth on said driven member, said terminal outer end portions being in intermeshing driving relation with the teeth on said driven member, said one end wall being in the form of an externally threaded plug which is threadedly carried by the side walls of said head, said plug having an opening therein through which said driven member extends, said extending portion of said driven member including an integral collar sealably abutting said plug to provide a barrier to the entry of bacteria into the internal parts of said hand piece and an integral serrated knob at the terminal end of said driven member which is spaced from said collar, said serrated knob being arranged in the form of an annular row of gear teeth which is coaxial with the axis of said driven member, and a disposable resilient dental applicator having a generally flat surface removably abutting said collar to form a seal therebetween, said applicator having a blind hole socket adjacent said flat surface, said socket being provided with an axis which coincides with the axis of said driven member, said socket of said dental applicator being stretched to fit over and to enclose said serrated knob whereby the teeth of said knob cut into said resilient dental applicator thus forming a positive lock therebetween and eliminating slippage of said applicator on said serrated knob, the seal formed between said collar and said applicator forming a barrier to the entry of bacteria into the socket of said dental applicator and the associated serrated knob.

4,182,042

MARKING DEVICE

Kazunori Konishi, Kobe; Hiromu Wakayama, Akashi; Toshihiro Nagatani, and Fumio Eto, both of Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Jun. 27, 1978, Ser. No. 919,567
Claims priority, application Japan, Jun. 27, 1977, 52-76918
Int. Cl.[2] B43L *13/00*
U.S. Cl. 33—18 R **1 Claim**



1. A marking device comprising:
a guide post having a guide surface and inclined to the vertical plane,
a horizontal arm carried by said guide post and movable up and down along said guide surface,
a detector for detecting the material on which the marking is to be effected carried by said horizontal arm, movable back and forth in a direction perpendicular to said material, a crosshead movable in a direction along the length of said horizontal arm,
a marking head carried by said crosshead, movable in a direction perpendicular to the direction in which said crosshead is moved; and
a marking member carried by said marking head, movable in a direction perpendicular to the directions in which said crosshead and said marking head are moved, respectively.

4,182,043

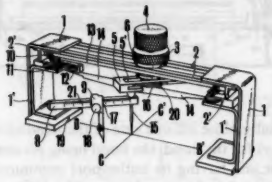
DRAWING INSTRUMENT FOR AN ELLIPSE

Yoshio Nemoto, 354, 2-chome, Tenjun-cho, Kodaira, Tokyo, Japan

Filed Jul. 18, 1978, Ser. No. 925,856
Claims priority, application Japan, Jul. 18, 1977, 52-85839
Int. Cl.[2] B43L *11/04*
U.S. Cl. 33—31 **2 Claims**

1. A drawing instrument for drawing an ellipse comprising; spaced-apart support members, means defining a guideway extending between said spaced-apart support members, a first arm member, a center connected to said first arm member, operating means slidably connected to said guideway means for movement therealong, means interconnecting said first arm

member, said center and said operating means for adjustably positioning said center at a selected distance from said operating means, a second arm member defining an extension of said first arm member, a slider adjustably disposed along said second arm member, a marking stylus carried by said second slider, a pair of laterally extending arms having their adjacent ends pivoted about said center, a rack connected to each opposite end of said laterally extending arms, a spur gear rotatably mounted on each of said support members, each spur gear



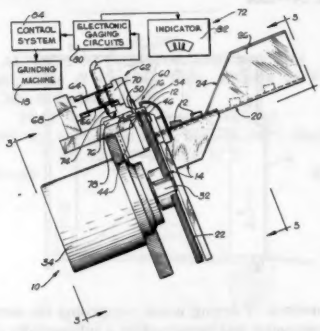
meshed with one of said racks, a first bevel gear connected to each of said spur gears, a second bevel gear meshed with each of said first bevel gears, and a common shaft connecting said second bevel gears, whereby said laterally extending arms defined with a straight line extending between said spaced-apart support members, two equal angles as said center traverses a straight line normal to said straight line extending between said spaced-apart support members as said operating means is moved.

4,182,044

GAUGING DEVICE FOR TAPERED ROLLERS OR THE LIKE

Edward Peonski, Dundee, Ill., assignor to American Gage & Machine Company, Elgin, Ill.

Filed Nov. 13, 1978, Ser. No. 959,892
Int. Cl.[2] G01B 7/04, 7/12, 7/30
U.S. Cl. 33—174 L **16 Claims**



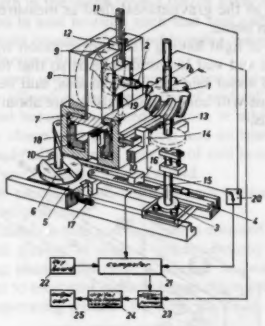
9. A gauging device for gauging rollers or the like,
comprising feeding means for feeding each roller to a gauging station,
first and second lower linear engaging elements at said gauging station for engaging and supporting each roller,
an end linear engaging element at said gauging station for engaging one end of the roller,
and a gauging head having an upper linear engaging element for engaging an upper portion of the roller,
said gauging head having biasing means for biasing said upper linear engaging element downwardly against the roller,
and output means for producing an output corresponding precisely with the position of said upper linear engaging element.

4,182,045

DEVICE FOR CHECKING INVOLUTES AND HELIX ANGLES OF GEARS

Manfred Bosch, Remscheid, and Richard Marquardt, Hückeswagen, both of Fed. Rep. of Germany, assignors to W. Ferd. Klingelnberg Sohne, Remscheid, Fed. Rep. of Germany

Filed May 15, 1978, Ser. No. 905,809
Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722452
Int. Cl.[2] G01B 7/28
U.S. Cl. 33—179.5 D **10 Claims**



1. A device for checking involutes and helix angles of cylindrical gears which includes: means to support a gear to be checked, a measuring feeler for producing a measured value, a mechanically operating transmission chain operable to guide said measuring feeler relative to said gear on a required reference curve, length pick-up means arranged at both ends of said transmission chain and adapted to emit signals representing the motions of linearly movable members at opposite ends of said transmission chain, computing means for multiplying the signal of one of said length pick-up means with the rated put-in transmission ratio of said transmission chain, and for subtracting said multiplied signal from the signal of the other said pick-up means, and means for subtracting with the proper prefix + or − the thus formed difference signal as a correction value from the measured value of said measuring feeler.

4,182,046

ELECTRONIC LEVEL AND PROTRACTOR

Roger D. Ludlow, 1193 Crestline Dr., San Jose, Calif. 95129, and Charles M. Rieker, 1145 Laureles Dr., Los Altos, Calif. 94022

Filed Jun. 2, 1978, Ser. No. 911,987
Int. Cl.[2] G01C 9/06
U.S. Cl. 33—366 **11 Claims**

1. An instrument for responding electrically to inclinations with respect to a gravity field, comprising:
first means defining a first reference axis whose inclination with respect to a gravity field is to be determined;
a vial having interior walls defining a chamber elongated in the direction of a longitudinal axis of the vial;
said vial being mounted in a fixed orientation with respect to said first reference axis so that said first reference axis and said longitudinal axis lie in a common plane;
a liquid and a bubble being confined within said chamber so that said bubble is free to move in the direction of said longitudinal axis within said chamber according to the inclination of said longitudinal axis with respect to the gravity field;
said vial chamber being convex upwardly, with respect to said gravity field, so that when said longitudinal axis is

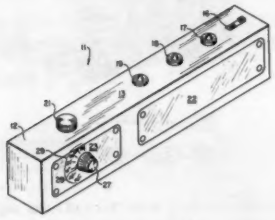
perpendicular to the gravity field, the bubble will be in a zero inclination position within said chamber;

when in the zero inclination position, said bubble, liquid, and vial define a liquid-bubble interface surface, a liquid-vial interior wall interface surface, and a bubble-vial interior wall interface surface;

sensing means passing a beam of radiation through said bubble in said zero inclination position, said sensing means receiving at least a portion of said beam of radiation from said bubble with said bubble in the zero inclination position and for producing an electric signal correlated to the radiation received so that the electric signal will vary whenever said bubble moves from its zero inclination position in the direction of said longitudinal axis;

display means receiving said electrical signal and producing a correlated display indicating the orientation of said vial relative to the gravitational field as measured within said common plane;

said beam of light having a fixed orientation with respect to said vial and vial longitudinal axis so that the rotation of said vial about said longitudinal axis, said beam and sensing means will correspondingly rotate about said longitudinal axis;



as seen in a plane perpendicular to said longitudinal axis and containing at least a portion of said beam between said sensing means and said bubble, said vial including means confining said bubble in its zero inclination position so that at least that portion of the beam from said sensing means to said bubble will only optically strike the bubble-vial interior wall interface surface exclusive of the liquid vial interior wall surface throughout an angular range of rotation of said vial and sensing means about said longitudinal axis of 20°, in either direction, from the vertical orientation of said common plane relative to the gravity field so that there will be no substantial change in the electrical signal; and

when said bubble is in said zero inclination position and said common plane is vertical with respect to the gravity field, the distance between opposed side walls of said vial having said bubble-vial interior wall interface surfaces, as measured along the beam path through said bubble, is no greater than one-third the natural bubble diameter that would result if said bubble were in said liquid and only confined by a top planar surface of the same material as said vial interior walls so as to provide a generally flat bubble end portion of said liquid bubble interface generally perpendicular to said longitudinal axis immediately adjacent said beam.

4,182,047

IRRADIATION UNIT

Kenneth F. Currie, 4/60 Sutherland Rd., Armadale, Victoria, Australia

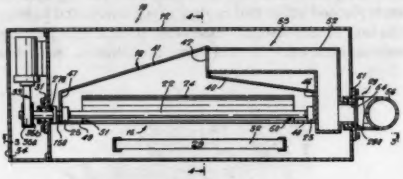
Filed Dec. 21, 1977, Ser. No. 862,916
Claims priority, application Australia, Dec. 23, 1976, 8601/76
Int. Cl.[2] F26B *3/34*; B01K *5/00*
U.S. Cl. 34—1 **14 Claims**

1. An irradiation unit comprising:

an outer housing defining an enclosure;

means for mounting an elongate irradiator, operable to emit electromagnetic radiation, for pivotal movement within the enclosure, which means includes one or more bearings received in an aperture or apertures in the housing; and

means to permit ventilation of the irradiator to the exterior of the housing, which means includes a hood arranged to



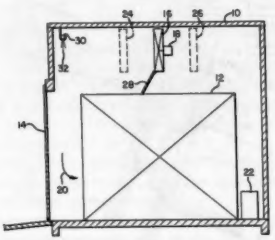
substantially close off one side of the irradiator, and an air outlet port for the hood, the hood being pivotable with the irradiator and having its outlet port communicating with the exterior of the housing by way of a duct passing within or about the or one of said bearings.

4,182,048

METHOD OF DRYING LUMBER

Charles M. Wolfe, and Steven W. Hinton, both of Jacksonville, Fla., assignors to U.S. Natural Resources, Inc., Portland, Oreg.

Filed Feb. 21, 1978, Ser. No. 879,396
Int. Cl.[2] F26B *7/00*
U.S. Cl. 34—13.4 **19 Claims**



1. A method of drying wood comprising the steps of:

(a) positioning said wood within a substantially closed drying kiln,

(b) circulating air within said kiln across said wood under controlled temperature conditions,

(c) dehumidifying the air within said kiln while maintaining the temperature of air circulating across said wood below a value of 120° F. until the average moisture content of said wood drops within the range of approximately 12 to 20 percent,

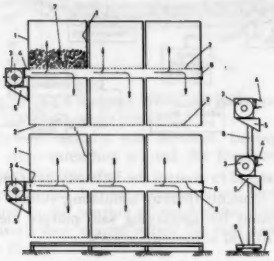
(d) discontinuing said dehumidification of the air within said kiln and heating the air circulating across said wood above 120° F. but below 180° F. until the average moisture content of said wood drops below approximately 10 percent.

4,182,049

METHOD AND APPARATUS FOR THE CONDITIONING OF PRODUCTS

Jacobus J. W. Lestraden, 4, Nachtegaallaan, Sassenheim, Netherlands

Filed Mar. 3, 1977, Ser. No. 773,973
Claims priority, application Netherlands, Mar. 4, 1976, 760247
Int. Cl.[2] F26B 3/06
U.S. Cl. 34—34 2 Claims



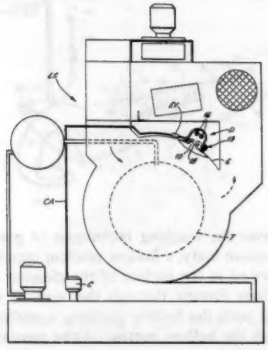
1. Method for conditioning products situated in stacked, partially open containers comprising stacking said containers in mutually spaced relationship one on top of the other and side by side and forming a gap between the containers stacked one on top of the other, disposing at least one ventilator unit at least between two containers stacked one on top of the other at one end of and directly in said gap between said containers while sealing said gap at the opposite end, said ventilator unit being removably attached to the said containers by means of fixing members and having an inlet or outlet nozzle which is adjustable with respect to height and permitting the height of said nozzle to adjust itself and link up with the upper and lower limits of said gap, and producing directly in said gap with said ventilator unit an air current which extends through said gap and into said partially open containers adjoining said gap and directly on to said products.

4,182,050

LAUNDRY APPARATUS AND DRYERS

Dante Righi, Città di Castello, Italy, assignor to Renzacci S.p.A., Città di Castello, Italy

Filed Jan. 5, 1978, Ser. No. 867,340
Claims priority, application Italy, May 16, 1977, 49428 A/77
Int. Cl.[2] F26B 3/04, 3/30
U.S. Cl. 34—60 4 Claims



1. In a machine for treating a load of cloth articles, said machine being a washing machine having an outer tub, a perforate rotatable drum housed in said tub for receiving said cloth articles, and a timer for cycling said machine through a series of operating phases, the improvement comprising:

an opening in said outer tub;

a housing having a lower opening larger than said tub opening and a base member affixed to said housing about the periphery of said housing opening, said housing sealingly affixed to the outer surface of said tub and located such that said housing opening and said tub opening are co-aligned, whereby said housing and a portion of the outer surface of said tub define a space adjacent said tub opening and communicating with said tub through said co-aligned tub and housing openings;

a pair of ultraviolet lamps for emitting radiation having a wavelength in the range from 2,000 to 3,000 A, said lamps positioned in said housing such that said radiation passes through said co-aligned tub and housing openings and into said perforate rotatable drum;

a door located within said housing, one side of said door hingedly affixed at the periphery of said tub opening for movement between a closed position in which said door sealingly closes said tub opening and an open position in which said radiation may pass out of said housing through said tub and housing openings; and

controllable means for moving said door between said open and closed positions;

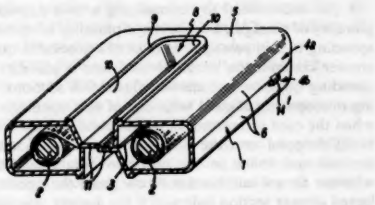
said controllable means and said lamps coupled to said timer such that during at least a predetermined one of said operating phases said door is opened and said lamps are activated to emit said radiation, and during the remainder of said operating phases said door is closed.

4,182,051

ENTERTAINMENT AND/OR EDUCATIONAL DEVICE

Dennis E. Flynn, Shavington, Groby Place, Altrincham, Cheshire, WA14 4AL, England

Filed Sep. 16, 1977, Ser. No. 833,745
Int. Cl.[2] G09B 1/24
U.S. Cl. 35—9 E 2 Claims



1. An entertainment and/or educational device comprising:

a housing, said housing having therein first and second chambers and a passageway between said chambers; said passageway having opposite walls at oppositely directed sides of said housing, each said wall having a window portion and a support portion with the window portion of each said wall being in superimposed relationship with the support portion of the other said wall;

first and second spools respectively rotatably mounted in said first and second chambers;

a display element in the form of an elongated film or web having a plurality of pairs of markings thereon, the markings of each said pair being respectively a question and an answer and being respectively on opposite sides of the display element; said display element being mounted on the said first and second spools and extending between said spools along said passageway;

means externally of said housing for manual rotation of said spools to move said display element along said passageway from said first spool to said second spool to succes-

sive display positions; said walls defining guide surfaces for guiding movement of said display element therebetween;

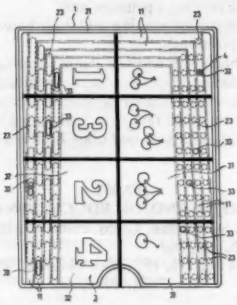
the markings of each said pair being offset relative to each other such that the markings of successive said pairs are simultaneously in alignment with said window portions at said successive display positions, whereby in each said position said markings of one said pair are displayed through said window portions but each marking can only be viewed at a respective one of said oppositely directed sides of the housing, and that part of the said display element which is aligned with each said window portion of each said wall is supported by the support portion of the other said wall.

4,182,052

EDUCATIONAL TOY

Hsing-Ching Liu, and Lan-dih Liu, both of 3F, No. 213, Chung Ching N. Rd., Sec. 4, Taipei, Taiwan

Filed Jul. 19, 1978, Ser. No. 925,929
Int. Cl.[2] G09B *3/00*
U.S. Cl. 35—9 R **10 Claims**



1. An educational toy comprising a base provided with a plurality of passages, a lid having a plurality of openings corresponding to said passages, a series of replaceable question and answer combination cards divided into a plurality of corresponding question and answer illustration sections, each having one opening aligned with one of said openings in said lid when the card is inserted on said lid, and at least one bead for being dropped into the opening in anyone of said question sections and rolled in the corresponding passage, whereby whether or not said bead rolls out from the opening in a selected answer section indicates if the answer selected is either affirmative or negative.

4,182,053

DISPLAY GENERATOR FOR SIMULATING VEHICLE OPERATION

Richard W. Allen, Manhattan Beach, and Jeffrey R. Hogge, Los Angeles, both of Calif., assignors to Systems Technology, Inc., Hawthorne, Calif.

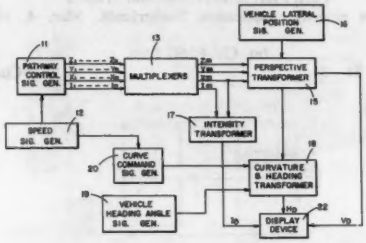
Filed Sep. 14, 1977, Ser. No. 833,162
Int. Cl.[2] G09B *9/04*
U.S. Cl. 35—11 R **12 Claims**

10. In a display generator for use in providing a display of picture elements,

means for generating a plurality of groups of control signals, each of said groups representing a different control signal component for developing the picture elements,

means for multiplexing the signals in each of said groups to form a composite signal for each of said groups, said composite signals including signals for controlling lateral and longitudinal and height (X, Y, and Z) axis picture element components and the intensity of said picture elements,

said signals for controlling the intensity of said picture elements including means for providing a phase varying



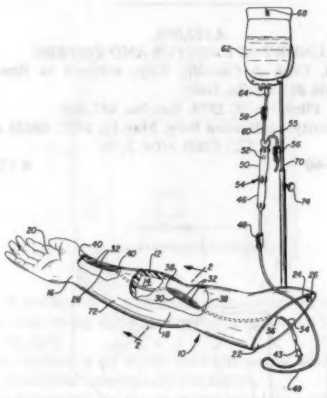
pulsed signal to control the intensity of at least one of the picture elements thereby simulating vehicle motion, and display means for displaying said picture elements in response to said composite signals.

4,182,054

ARTIFICIAL ARM

Charles D. Wise; Ernest E. Lowrey; Oliver W. Lowrey; Thomas R. Williams, and Price Neeley, all of Gatesville, Tex., assignors to Medical Plastics Laboratory, Inc., Gatesville, Tex.

Filed Feb. 16, 1978, Ser. No. 878,229
Int. Cl.[2] G09B *23/30*
U.S. Cl. 35—17 **12 Claims**



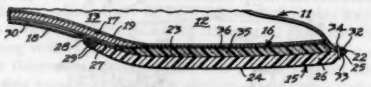
11. In a device for teaching techniques of puncturing an artery of the human body; a hollow resilient member, at least one groove formed in the surface of the member and one or more perforations formed through the wall of the groove communicating with the hollow portion; a resilient tube extending through the hollow portion of the member, through the wall of the member; along said groove and back through the wall into the hollow portion of the member; and a resilient skin textured cover secured over the member and tube.

4,182,055

SHOE CONSTRUCTION WITH PRE-FORMED SOLE

Newton C. Turner, Jr., Nashville, Tenn., assignor to Genesco, Inc., Nashville, Tenn.

Filed Oct. 13, 1977, Ser. No. 841,677
Int. Cl.[2] A43B *13/12, 9/10, 13/04*
U.S. Cl. 36—30 R **7 Claims**



1. In a shoe construction,
(a) an upper having a forepart lower marginal portion and a backpart lower marginal portion,
(b) a pre-formed, unitary, sole member, having an outer marginal edge extending around the forepart sides and front of said sole member,
(c) said sole member having a concave top face generally conforming to the portion of the bottom surface of the shoe wearer's foot against which the sole member is designed to fit, and a bottom face,
(d) said top face being laterally coextensive with said outer marginal edge,
(e) a marginal recessed portion in said bottom face adjacent to, merging with, and coextensive with said outer marginal edge to form a marginal stitching land, and an inner portion of said sole member,
(f) said stitching land comprising a bottom surface gradually inclining laterally outward and gradually curving concave downward laterally between said inner portion and said outer marginal edge to merge with said outer marginal edge, and to form a relatively thin, outward tapering, outer portion of said stitching land,
(g) a first line of fine stitching securing said forepart lower marginal portion to said relatively thin outer portion of said stitching land, and
(h) a second line of heavy stitching securing said forepart lower marginal portion generally to a relatively thicker portion of said stitching land than the portion secured by said first line of stitching.

4,182,056

PLIABLE INNER BOOT AND INJECTABLE FIT PACKS FOR SKI BOOTS

Melvin W. Dalebout, Salt Lake City, Utah, assignor to Engineered Sports Products, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 711,476, Aug. 4, 1976, Pat. No. 4,078,322. This application Mar. 6, 1978, Ser. No. 883,460
Int. Cl.[2] A43B *5/04, 19/00;* **A43D** *9/00*
U.S. Cl. 36—117 **25 Claims**

1. In a ski boot including a rigid outer shell and a pliable inner boot formed substantially completely of resinous foam material from its inner surface to its outer surface, the improvement which comprises:

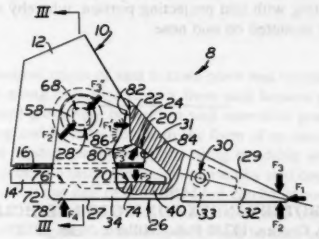
a pliable custom fitting reservoir interposed between the rigid outer shell and the inner surface of the inner boot in the vicinity of the heel pocket and the instep portions of the inner boot, said reservoir being adapted to contain a quantity of liquid resin reaction mixture and to deform in response to insertion of a foot into said inner boot thereby to form said quantity of reaction mixture into a custom shape and to hold said reaction mixture in said custom shape until it has reacted sufficiently to solidify.

4,182,057

RELEASABLE CORNER TOOTH ASSEMBLY

Gene R. Klett, Joliet, and Jerome A. Thies, Geneseo, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 16, 1978, Ser. No. 916,456
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—141 T **11 Claims**



1. In a releasable corner tooth assembly (8) of the type including an implement (10) and an adapter (26); the implement (10) having a normal forward longitudinal direction of working movement, an upright sidewall member (12) and a laterally disposed cutting edge (14) connected to the sidewall member (12); the adapter (26) having a pair of laterally spaced outer and inner mounting portions (35,36) defining a first slot (38) therebetween, a bottom portion (40) connected to the outer mounting portion (35) and defining a second slot (42) with the inner mounting portion (36), the first slot (38) straddling the sidewall member (12) and the second slot (42) straddling the cutting edge (14); the improvement comprising:

step means (20) defined in said sidewall member (12);

projection means (80) for transmitting a portion of an external working force on said adapter (26) into said step means (20) of the sidewall member (12); and

first means (28) for releasably connecting said adapter (26) to said implement (10) and transmitting another portion of said external working force into said sidewall member (12).

4,182,058

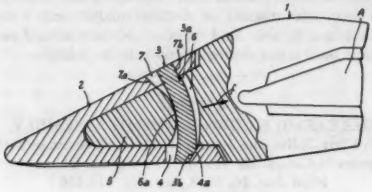
TEETH OF BUCKETS FOR MECHANICAL AND HYDRAULIC SHOVELS

André Poncin, 27, Rte. de Warnecourt, 08 Prix les Mezieres, France, assignor to André Poncin, France

Filed Jan. 4, 1978, Ser. No. 866,901
Claims priority, application France, Jan. 14, 1977, 77 01060
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—142 A **3 Claims**

1. A replaceable metallic tooth cap mounted on a nose of a support, the nose having a cross-bore, orifices in the cap having central axes and communicating with opposite ends of said bore, and a cotter extending through said bore and said orifices for mounting the cap on said nose, the improvement wherein said bore is defined by a wall presenting a metallic surface which has a first radius of curvature, said cotter being of spring steel and having a radius of curvature greater than said first radius of curvature so as to be spring bent in place while engaging said metallic surface and walls of said orifices, one of said

orifice walls being inclined relative to the central axis of said orifice at said one wall, the other of said orifice walls having a portion projecting partially into said bore, said cotter having a



surface at one end thereof cooperating with said inclined wall, and said cotter having a shoulder at an opposite end thereof cooperating with said projecting portion, whereby said cap is securely mounted on said nose.

4,182,059

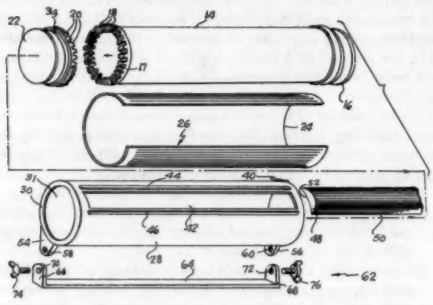
ROTARY INDEX FOR MOTOR VEHICLE

Frank D. Greene, 13730 Polk, Millard, Nebr. 68137

Filed Jan. 24, 1978, Ser. No. 871,856

Int. Cl.[2] G09F 9/00

U.S. Cl. 40—377 **5 Claims**



3. A rotary index device adapted to be mounted on a support surface, such as a dashboard of a motor vehicle, which comprises:

an inner cylindrical support member having turning means positioned at one end thereof and having means for bearing information positioned on the curved surface thereof;

an outer cylindrical casing within which said inner cylindrical support member is rotatably positioned and having a through aperture extending longitudinally therein through which said means for bearing information may be viewed;

means selectively positionable over said through aperture for magnifying said information;

wherein said means for magnifying said information comprises a magnifying lens having an arcuate inner surface of substantially the same curvature as the outer surface of said outer casing; and

wherein said outer casing includes a pair of parallel guide members positioned respectively above and below said through aperture for slidably receiving said magnifying lens therebetween.

4,182,060

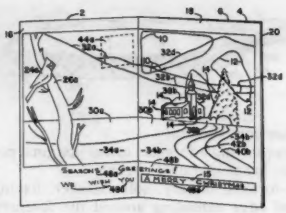
GREETING CARD

Lineaus W. Longenecker, R.D. #5, Manheim, Pa. 17545

Continuation-in-part of Ser. No. 614,817, Sep. 18, 1975, Pat. No. 4,055,011. This application Oct. 25, 1977, Ser. No. 844,844

Int. Cl.[2] G09F 1/000

U.S. Cl. 40—124.1 **12 Claims**



1. A greeting card comprising

a front leaf having a rear side,

a rear leaf having a front side adjoining the rear side of the front leaf,

pictorial materials on said rear side of the front leaf and on the front side of the rear leaf which together form a single view,

a center leaf positioned between the front leaf and the rear leaf and hingedly supported at the juncture of said rear side of the front leaf and the front side of the rear leaf, said center leaf being movable from a first position where it overlies the front side of the rear leaf to a second position where it overlies the rear side of the front leaf,

said center leaf having a front side provided with pictorial elements which have a shape and location corresponding to the shape and location of pictorial elements on the front side of the rear leaf, said center leaf having a rear side provided with pictorial elements which have a shape and location corresponding to the shape and location of pictorial elements on the rear side of the front leaf,

said center leaf having transparent areas for exposing portions of said sides lying therebeneath and opaque areas for concealing portions of said sides lying therebeneath,

textual material on one of said rear side of the front leaf or front side of said rear leaf,

said transparent area being aligned with said textual material whereby said textual material aligned with said transparent area is visible when the center leaf is in either of said positions.

4,182,061

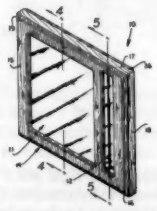
DISPLAY FRAME

J. Richard English, 1168 Oakleigh Dr., East Point, Ga. 30344

Filed Dec. 5, 1977, Ser. No. 857,782

Int. Cl.[2] G09F 1/12

U.S. Cl. 40—152.1 **4 Claims**



1. A display frame assembly comprising a frame having a

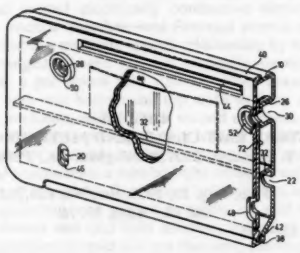
front display surface and a back surface and defining at least two window openings therethrough, transparent sheet material in each window opening, a backing sheet behind said transparent sheet material in one of said window openings, backing sheet retaining means mounted in said frame for maintaining said transparent sheet material and said backing sheet material adjacent the front surface of said frame, a display tray positioned in another one of said windows, said display tray being approximately the same length, width and thickness as its window to substantially fill its window, said display tray defining a concave surface facing the transparent sheet material and forming with said transparent sheet material a space for receiving a three-dimensional object, and a back support sheet removably mounted to the back surface of said frame and confining said transparent sheet material, said backing sheet and said display tray in said frame, whereby a photograph or like two-dimensional object can be placed between said backing sheet and said transparent sheet and a three-dimensional object placed behind said transparent sheet and in the space at the concave surface of said display tray and confined in said frame by said back support sheet for display through said transparent sheet material.

4,182,062

LICENSE PLATE LOCK BOX ASSEMBLY

Tom Krokos, Windsor, and Richard C. Hofrichter, London, both of Canada, assignors to Ticketcheck International Limited, London, Canada

Filed Aug. 29, 1977, Ser. No. 828,858
Int. Cl.² G09F 7/00
U.S. Cl. 40—209 **4 Claims**



1. A locking box assembly to enclose a license plate of a motor vehicle and to be secured to said motor vehicle, said assembly comprising:

(i) a holding means to be secured to said motor vehicle;

(ii) a transparent cover plate to cover and enclose said license plate with a horizontal slot in the upper portion of the cover plate;

(iii) a locking means to releasably lock said cover plate to said holding means;

wherein a horizontal shelf is provided on the inner surface of the holding means, said shelf for retention of paper or like material inserted through the slot in the cover plate, said shelf having a marginally downwardly depending top surface whereby any moisture entering said assembly will drain off said shelf to the bottom of said assembly.

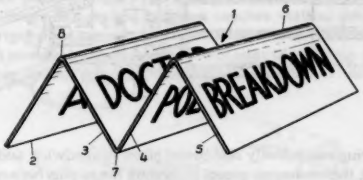
4,182,063

SIGNAL DISPLAY

Georg W. Klösel, Falkensteiner Strasse 12, 624 Konigstein, Fed. Rep. of Germany

Filed Dec. 13, 1976, Ser. No. 750,645
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2555966
Int. Cl.² G09F 15/00
U.S. Cl. 40—610 **8 Claims**

1. A signalling device comprising an accordion-like folded card having a number of card parts respectively having surfaces adapted to carry information, said card parts being movable between an inoperative position folded against each other and an operative position in which said card parts are erected in form of an inverted V; and a packing and holding device having a bottom plate having a pair of longitudinal edges and being about the size of a card part and side walls composed of two transparent foils about the size of said bottom plate and each connected along one edge thereof to a respective one of



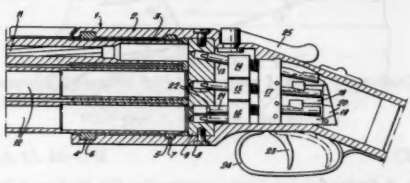
said longitudinal edges of said bottom plate and connected to each other along one edge distant from said bottom plate so that said card parts may be held in said operative position in said packing and holding device in the form of an inverted V; at least one of said transparent foils being bendable about the middle thereof; and fastening means carried by said one foil by means of which one half of the folded foil can be connected to the other half so as to hold said card parts in said inoperative position folded against each other onto said bottom plate.

4,182,064

FIREARM HAVING TWO OR MORE BARRELS

Marten Martensson, Ostersund, Sweden, assignor to A B Servator, Syltebruk, Sweden

Filed Oct. 3, 1977, Ser. No. 838,887
Int. Cl.² F41C 11/10
U.S. Cl. 42—12 **5 Claims**



1. An over-under firearm comprising: a breech block, a barrel block, at least one rifle barrel and at least one shot barrel mounted in said barrel block and superimposed relative to one another, means mounting said rifle barrel at a small angle relative to the shot barrel to compensate for the different trajectories of projectiles discharged from the barrels, and means mounting said barrel block to pivot about a vertical axis relative to said breech block so that the rear ends of said barrels are offset laterally with respect to the breech block for loading and unloading.

4,182,065

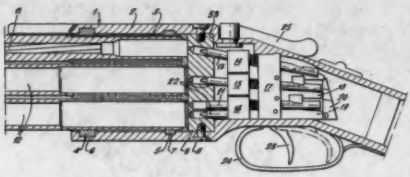
FIRE-ARM

Marten Martensson, Ostersund, Sweden, assignor to A B Servator, Syltebruk, Sweden

Filed Oct. 3, 1977, Ser. No. 838,911
Int. Cl.² F41C 11/10
U.S. Cl. 42—12 **18 Claims**

1. An over-under firearm comprising: a breech frame, a barrel block, at least two barrels mounted in said barrel block and superimposed relative to one another, and means mounting

said barrel block to pivot about a vertical axis relative to said breech frame so that the rear ends of said barrels are offset laterally with respect to said breech frame for loading and unloading, said barrel block mounting means including upper and lower extensions on said breech frame overlying and underlying respectively said barrel block to sandwich said barrel block therebetween, means providing hinge pins between said barrel block and said extensions, and means providing curved mating rib and groove connections disposed between said upper and lower extensions and said barrel block and curved transversely in a horizontal plane to afford said pivotal motion.

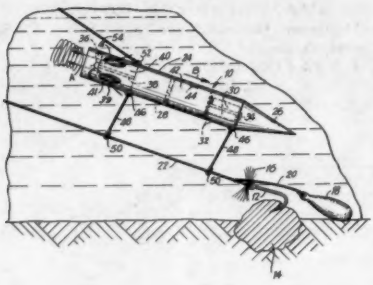


4,182,066

DRIVEN DEVICE FOR DISLODGING FISH HOOK

John Harmon, 1840 E. 56th Ave., Anchorage, Ak. 99507

Filed Apr. 6, 1978, Ser. No. 894,077
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—17.2 **1 Claim**



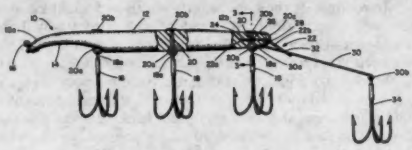
1. A device for dislodging an entangled fish hook on a fishing line comprising a housing, said housing having a forward end and a rear end, said housing including a nose cone at its forward end, electrical supply means located in said housing proximate said forward end, a motor drive carried by said housing proximate said rear end, a propeller extending beyond said housing and operatively associated with said motor drive, a shroud affixed to said housing and surrounding said propeller, said shroud being provided with openings for the entry of fluid into said shroud, said openings being located forwardly of said propeller, electrical means including a switch electrically connecting said electrical supply means to said motor drive, a compartment within said housing of sufficient size to impart bouyancy to said device, fluid inlet means communicating with said compartment through said housing for selectively filling said compartment for adjusting the bouyancy of said device, a pair of leader lines attached to said housing at longitudinally spaced positions, one said leader line being attached rearwardly of said nose cone and the other leader line being attached forwardly of said shroud, connecting means on said leader lines for slidably connecting each said leader line to the fishing line, and connecting means carried by said housing for attaching a retriever line to said housing.

4,182,067

FISH LURE

Charles W. Pfister, and Charles W. Pfister, Jr., both of 211 N. Ashland Ave., Park Ridge, Ill. 60068

Filed Jan. 13, 1978, Ser. No. 869,378
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.22 **12 Claims**



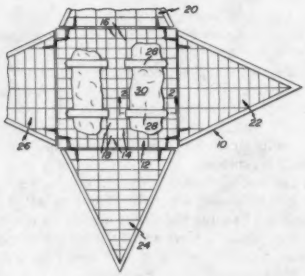
1. In a fish lure comprising an elongated body portion having a head end and a tail end, a depth regulating member secured by the body portion at the tail end thereof and extending outwardly and rearwardly therefrom, and a hook carrying outrigger assembly extending from and at least partially supported by the depth regulating member, said assembly comprising a pair of elongated elements which diverge outwardly and rearwardly from the depth regulating member, each of said elements having at least one hook unit attached to the distal end portion thereof and serving to create a fish-attracting wake pattern rearwardly of the body portion of the lure as the lure is drawn through water.

4,182,068

CRAB TRAP BAIT CLAMP AND METHOD OF USING

Dorothy T. Iannucci, 3527 Nottingham La., Philadelphia, Pa. 19114

Filed Aug. 29, 1977, Ser. No. 828,702
Int. Cl.[2] A01K *69/10*
U.S. Cl. 43—105 **17 Claims**



1. In a crab trap having a bottom wire screen provided with plural spaced wires and a clamp for holding bait substantially stationary on said screen, the improvement comprising:

a flexible resilient strip provided with a substantially flat portion and first and second ends, said first end having a curved portion which curves away from said flat portion and towards said flat portion to define a slot for receiving at least one of said screen wires in pivotable rotation,

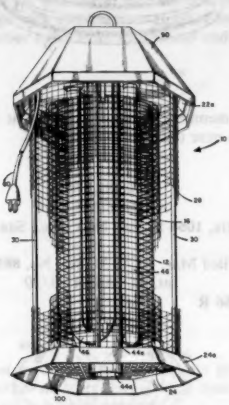
said second end having a curved portion which curves away from said flat portion to frictionally engage another of said screen wires upon deformation of said strip.

4,182,069

APPARATUS FOR ELECTRICALLY EXTERMINATING INSECTS

Sal G. De Yoreo, Andover, Mass., assignor to Automatic Radio Mfg. Co., Inc., Melrose, Mass.

Filed Jun. 28, 1977, Ser. No. 809,971
Int. Cl.[2] A01M *1/04, 1/22*
U.S. Cl. 43—112 **6 Claims**



1. Apparatus for electrically exterminating insects, comprising: first and second electrically conductive elements surrounding an interior chamber, said first and second elements being supported in a mutually spaced relationship by insulators and being arranged between opposed vertically spaced top and bottom walls, a perforated side wall extending between and cooperating with said bottom and top walls to form a protective housing enclosing said first and second elements, said top wall having an access opening therein leading to said interior chamber, a carrier assembly having a support plate and including a integral components a tubular light reflector surrounded by a plurality of detachable fluorescent light sources, means for removably mounting said carrier assembly on said top wall with said reflector and said light sources protruding through said access opening into said interior chamber, electrical means for connecting said light sources and said first and second elements to an electrical power cord, said electrical means comprising a voltage augmenting transformer mounted on the upper surface of said top wall and electrically connected to said first and second elements, a starter module and a ballast for each light source, said starter modules being mounted on the upper surface of said support plate and said ballasts being mounted on the upper surface of said top wall, separable connection means arranged between said starter modules and said ballasts for accommodating removal of said carrier assembly, and a protective cover detachably mounted in an operative position overlying said electrical means.

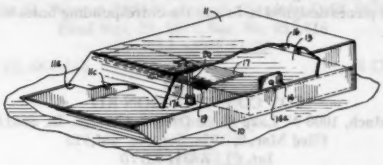
4,182,070

TAMPER-PROOF POISONOUS BAIT BOX

Richard E. Connelly, Jeromesville, Ohio, assignor to Contractor Equipment Manufacturers, Inc., Ashland, Ohio

Filed Apr. 11, 1978, Ser. No. 895,437
Int. Cl.[2] A01M *25/00*
U.S. Cl. 43—131 **3 Claims**

1. A tamper-proof poisonous bait box, comprising a lower box portion of sheet material having a bottom wall and integral sides opening upwardly, an upper box portion of sheet material having a top wall and integral sides opening downwardly, said box portions being generally rectangular, said upper box portion being shorter at its front end than said lower box portion and with its sides and back end meeting the sides and the associated end of the lower box portion tightly, releasable means for holding said box portions together, a swingable door having parallel linear sides at its upper and lower edges and extending generally entirely across said box, the upper edge of said door having a horizontal hinge connection with said side walls of said upper box portion, a spring operatively connected with said door urging the same to swing the free lower edge of said door downwardly, the width of said door being greater than the vertical distance from the top wall of said upper box portion to the bottom wall of said lower box portion so that said door under urging by said spring will hit said bottom wall of said lower box portion before it reaches vertical position, and a rigid door-support pin in said lower box portion in a support position beneath the free lower edge of said door when the latter extends generally horizontally away from its hinge



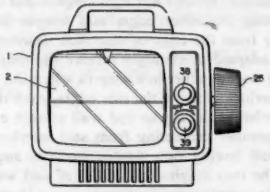
connection, said pin in said support position being of a length to just pass through said bottom wall of said lower portion, said bottom wall of said lower box portion having a support structure mounting said pin for free vertical movement, whereby poisonous bait may be placed in the back part of said lower box portion and said box portions secured together and said door moved against said spring action to a generally horizontal position extending rearwardly from its hinge connection, then said support pin is held upward in said support position while said box is set down on a supporting surface, and subsequent movement of said box away from said supporting surface will permit said support pin to drop and said door to fall to a closed position, after which said poisonous bait cannot be touched until said door is manually re-set in said support position.

4,182,071

TOY TELEVISION SET

Masatoshi Todokoro, 2-33 Kognaehara 2-chome, Matsudo-City, Chiba-Prefecture, Japan (270)

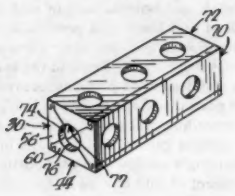
Filed Dec. 6, 1977, Ser. No. 857,932
Int. Cl.[2] A63H *33/30*
U.S. Cl. 46—1 R **1 Claim**



1. A toy television set comprising a case modeled after the cabinet of a real TV set, a transparent screen provided on the front side of said case, a horizontal shaft disposed across the center of said screen in the inside of said case, a clutch plate secured to an end of the shaft, a prime mover with an output end adapted to give rotative power to said shaft including, a driving plate having pawls and a windup spring, said pawls being engagable with said clutch plate, and being secured at the prime mover output end loaded with said windup spring which is wound up by a grip extending outside of the case, a driving gear and a reduction gear train, said driving gear being secured to said driving shaft in engaged relation with said

reduction gear train, said gear train including a slot support and a first gear pivotally supported in said slot support along which it is movable in an elongated manner to a position where it disengages from the succeeding gear, and a final gear of said gear train, with a detent and an operating bar engageable with said detent coupled to said grip mounted rotatably outside said case, a ratchet along the peripheral edge of said clutch plate and a stopper bar engaged with said ratchet to lock the clutch plate when said clutch plate is turned in the direction of windup of the windup spring, a pair of discs, one disc being secured to each end of said shaft, each of said discs being formed with a plurality of holes along the periphery thereof and, a plurality of leaves with sides and lower ends on which pictures, characters, words, etc. are drawn, each of said leaves having extending from both sides of the lower end thereof insert pieces designed to fit into the corresponding holes in said discs.

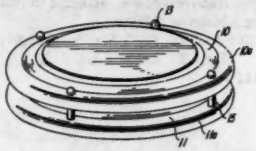
4,182,072
TOY CONSTRUCTION KIT
Joe Much, 1000 N. Lake Shore Dr. #9, Chicago, Ill. 60611
Filed Mar. 9, 1978, Ser. No. 884,912
Int. Cl.[2] A63H *33/10*
U.S. Cl. 46—17 **21 Claims**



1. A toy construction kit comprising:
a plurality of interlockable thin wall members adapted to form composite, hollow structural members, each wall member having two major side surfaces defined by two opposed end edges and two opposed longitudinal edges, one of said major side surfaces being an interior surface and one of said major side surfaces being an exterior surface in the formed composite hollow structural member, each wall member having two spaced apart, resilient wall portions defining therebetween a longitudinal groove extending along one edge of the wall member and each wall member further having a longitudinal tongue extending along the other edge, said tongue projecting outwardly from the edge of said wall member, said groove being adapted to matingly receive the tongue of another similar wall member in a snap fit when the wall members are interlocked along the side edges, each thin wall member further including an end wall at each end of the thin wall member projecting from said interior surface, said end wall having two slanted surfaces angled inwardly from the two longitudinal edges of said wall member to provide a reinforcing abutment against identical end walls of two other similar wall members when said two other wall members are each in side-to-side tongue and groove snap fit engagement with said one wall member.

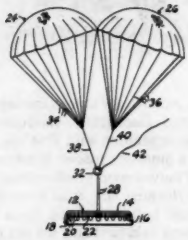
4,182,073
TWIN FLYING SAUCER TOY
Michael A. Tabet, 1302 Pamela Pl., Norfolk, Va. 23518
Filed May 15, 1978, Ser. No. 905,941
Int. Cl.[2] A63H *27/00*
U.S. Cl. 46—74 D **3 Claims**

1. A toy adapted to be manually thrown upwardly and outwardly into the air with rotation about its vertical axis and to be caught by grasping its rotating peripheral edge while in flight comprising a pair of vertically spaced concave-convex



shaped disc members secured together at circumferentially spaced points near their peripheral edges.

4,182,074
AIRBORNE TOY
Nilson V. Ortiz, 1064 S. Van Ness Ave., San Francisco, Calif. 94110
Filed Mar. 10, 1978, Ser. No. 885,231
Int. Cl.[2] A63H *33/20*
U.S. Cl. 46—86 R **2 Claims**



1. In an aerial toy in combination with a collapsible toy parachute having shroud lines, the improvement comprising:
an inverted substantially dish-shaped body having a downwardly open recess and having an axially apertured generally flat upper wall;
disk means including a generally flat disk of smaller diameter than the diameter of the body recess normally underlying said body and closing the recess when said toy parachute within the body recess when said toy parachute is in a rolled up condition; and,
support strand means including a first elongated flexible strand longitudinally slidably extending through the body aperture for supporting said toy during launching and a second elongated flexible strand normally extending radially across the outer surfaces of said body and connected at its respective ends with the parachute shroud lines and the end portion of said first strand opposite said disk,
said first strand being connected with said disk in a manner to maintain the disk in body recess closed position when the mass of the body and disk is supported via the first strand and to permit movement of said disk to a body recess open position when said body is airborne.

4,182,075
CAP-FIRING ARM FOR A TOY FIGURE
David F. James, Redondo Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 6, 1978, Ser. No. 875,436
Int. Cl.[2] A63H *5/00*
U.S. Cl. 46—118 **14 Claims**

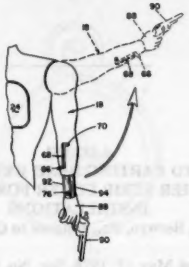
1. In a toy figure, the combination comprising:
a torso;
a generally hollow arm having a shoulder portion;

means movably mounting said shoulder portion to said torso;

a barrel member within said arm, said barrel member having a generally closed end adjacent said shoulder portion, said closed end having an aperture extending therethrough;

a hammer member slidably mounted for movement within said barrel member, said hammer member having a rod portion configured for extending through said aperture;

spring means within said barrel member coacting with said closed end and with said hammer member for urging said hammer member away from said closed end;



another member mounted within the lower portion of said arm, said another member having anvil means therein for contact by said hammber member;

means for cocking said hammer member against the force of said spring means with said rod portion end extending through said aperture; and

means for moving said arm from a first position to a second position and for contacting said rod portion end upon said arm reaching said second position for releasing said hammer member to cause the same to strike said anvil member.

4,182,076

ANIMATED DOLL

Derek J. Gay, Rancho Palos Verdes; Nicol S. Wilson, Redondo Beach; Roger H. Sweet, Long Beach, and Saint E. B. Berford, Lakewood, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 17, 1978, Ser. No. 878,856
Int. Cl.[2] A63H *11/00*
U.S. Cl. 46—265 **9 Claims**

1. In a doll, the combination comprising:

a torso;

a head member mounted on said torso;

a first leg pivotally mounted on said torso;

detent means for fixedly positioning said first leg in general alignment with the longitudinal center line of said torso;

a second leg pivotally mounted on said torso;

a manually operable actuating member including a cam member movably reciprocably mounted within said torso, said actuating member including a cam member, said actuating member extending on the longitudinal center line of said doll through said head member and terminating with a knob which is manually depressible; and

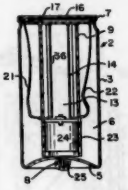
means including crank means configured to be engaged by said cam member coupled to said second leg within said torso and responsive to manipulation of said actuating member for pivoting said second leg with the toe of said first leg on a surface with said first leg detended whereby to simulate the movement of a balerina.

4,182,077

SOLAR POWERED ELECTRIC TOY TOP

Clyde M. Wagner, 325 E. Stocker, Glendale, Calif. 91207, and John H. Wagner, 1100 N. Central, Glendale, Calif. 91202

Filed Nov. 21, 1977, Ser. No. 853,416
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—248 **8 Claims**



1. An amusement device, comprising:

an enclosure, said enclosure having a top, a longitudinal length, and a bottom wall;

a solar cell mounted along said top;

an electrical motor mounted within said enclosure and electrically connected to said solar cell, said electrical motor including a shaft extending outwardly of said enclosure;

means for mounting said solar cell to said enclosure along the top thereof, said means for mounting said solar cell in said enclosure comprises a core, said core having a first end supporting said solar cell, and a second end, said second end having a receptacle formed in it for receiving said motor; and

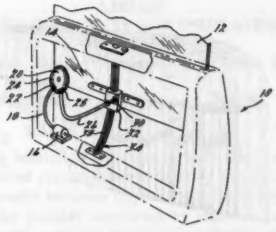
means attached to the shaft of said motor for causing movement of said enclosure.

4,182,078

WINDOW REGULATOR AND DRIVE ASSEMBLY

Donald D. Bartholomew, Marine City, Mich., assignor to Merit Plastics, Inc., East Canton, Ohio

Filed Feb. 13, 1978, Ser. No. 877,264
Int. Cl.[2] E05F *15/16*
U.S. Cl. 49—139 **18 Claims**



1. An automobile window regulator and drive mechanism comprising:

a generally vertically extending rack;

guide means disposed in sliding relationship with respect to a portion of said rack and movable with respect thereto, said guide means being adapted to be secured to a lower portion of a window;

a worm gear supported on said guide means in oblique meshing engagement with said rack;

a flexible shaft having one end drivingly connected to said worm gear; and

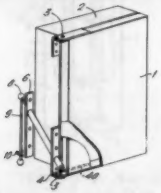
drive means operatively connected to another end of said flexible shaft for imparting rotational movement thereto, said drive means, flexible shaft, worm gear and rack cooperating to vary the position of said window.

4,182,079

CLOSURE OPERATOR

Folke Hederus, Stickudden, Tyktorpsvagen 3, S-181 31 Lidingo, Sweden

Filed Dec. 7, 1977, Ser. No. 858,299
Claims priority, application Sweden, Dec. 9, 1976, 7613871
Int. Cl.[2] E05F *11/36*
U.S. Cl. 49—354 **7 Claims**



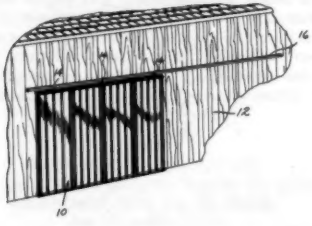
1. A device for actuating a panel member mounted to a frame member for pivotal movement about a predetermined axis, comprising an elongated rod rotatable about its longitudinal axis and mounted at an acute angle relative to said pivot axis, a carrier finger rigidly connected to one end of said rod and projecting at an appropriate angle thereto, the longitudinal axis of said rod and the longitudinal axis of said carrier finger intersecting at approximately said predetermined axis,; same line, adjacent said predetermined axis has been inserted after "slot" means defining a guide slot in said panel, said carrier finger engageable in said slot and operable, upon rotation of said rod about its axis to effect through said carrier finger and slot, rotation of said panel relative to said frame about said pivot axis.

4,182,080

SECTIONALIZED DOOR FOR A BARN OR SIMILAR STRUCTURE

Donald B. Naylor, Rte. 4, Box 357, Plymouth, Ind. 46563

Continuation-in-part of Ser. No. 769,264, Feb. 16, 1977, abandoned. This application Feb. 15, 1978, Ser. No. 877,953
Int. Cl.[2] E05D *13/00, 15/48*
U.S. Cl. 49—410 **12 Claims**



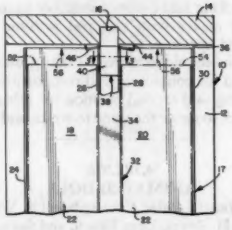
1. A door for a barn or similar structure comprising a horizontal top rail and a horizontal bottom rail, at least two separable panel parts positioned side by side and fitting between said top and bottom rails, each panel part including spaced vertical channel-shaped frame supports, one frame support of each panel part having a groove section, the other frame support of each panel part having a protruding tongue section, the frame support tongue section of one panel part fitting lockingly into the frame support groove section of another panel part with said panel parts lying in substantially the same plane, said top rail overlying said joined panel parts and being secured thereto, and means for mounting said locked panel parts to said barn or similar structure for shiftable opening and closing movement.

4,182,081

COMBINED PARTING BEAD EXTENDER AND WEATHER STRIP COVER FOR WINDOW INSTALLATIONS

Barry M. Jones, Berwyn, Pa., assignor to QC Glide Co., Sharon Hill, Pa.

Filed May 11, 1978, Ser. No. 905,281
Int. Cl.[2] E05D *15/18*
U.S. Cl. 49—434 **6 Claims**



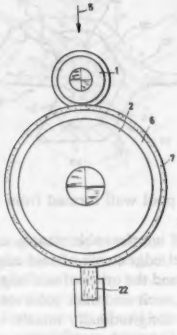
1. A combined parting bead extender and weather-strip connector for use with a unitary, double hung, double sash window guide and weather-strip of the type having a pair of side-by-side longitudinally extending, channel shaped sash guides centrally joined together by an integral parting bead defined by a longitudinally extending open ended, U-shaped channel having a laterally extending end wall joining together in spaced relation a pair of co-extensive side walls each of which also defines one wall of a respective sash guide channel, said weather-strip in its position of use being adapted to abut the side jamb of a window frame with the upper end of said weather-strip being spaced below the head jamb of said frame thereby defining a gap between said head jamb and the upper end of said weather-strip; said parting bead extender and weather-strip connector comprising a U-shaped body member having an end wall and side walls complementary with the internal shape and dimensions of said parting bead and being adapted to be slidably received within the upper open end of said parting bead with the end wall of said extender being adjacent the end wall of said parting bead, when said weather-strip and extender are in their position of use, upwardly extending prong means integrally joined with the upper edge of said body member, and means carried by said body member and engageable exteriorly of said parting bead for moving said body member upwardly relative to said parting bead to close the gap between the upper end of said weather-strip and said head jamb while simultaneously driving said prong means into said head jamb to connect said weather-strip in its position of use in said window frame.

4,182,082

METHOD FOR THE PROFILING OF GRINDING WHEELS AND APPARATUS THEREFOR

Hans-Robert Meyer, Hamburg, Fed. Rep. of Germany, assignor to Ernst Winter & Sohn (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Jan. 19, 1978, Ser. No. 870,717
Int. Cl.² B24B *53/06*
U.S. Cl. 51—5 D **14 Claims**



1. A method for the profiling of grinding wheels containing at least one of the abrasives selected from the group consisting of diamond and cubic crystalline boron nitride, interspersed in a metallic brittle bond, said method comprising the steps of:

(a) truing a grinding wheel by rolling a profile into the contour surface of said grinding wheel, said truing being performed with partial break-out and partial loosening of the material particles in the bonding of said wheel; and

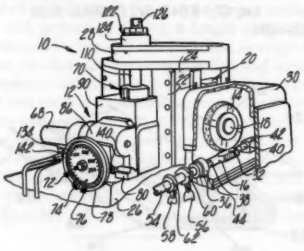
(b) dressing the profile of said contour surface of said wheel, by applying against said wheel immediately subsequent to said rolling of said profile, an abrasive block which continuously adapts its shape to the profile of said wheel.

4,182,083

GRINDING WHEEL FEED PROGRAMMER

Anthony Kushigian, P.O. Box 768, Hendersonville, N.C. 28739

Filed Aug. 23, 1978, Ser. No. 936,252
Int. Cl.² B24B *49/00*
U.S. Cl. 51—165.79 **4 Claims**



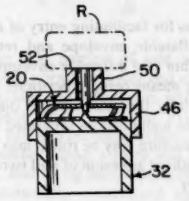
1. A grinding machine feed programmer for moving a grinding wheel toward a workpiece for making successively deeper material removing cuts along the same path through the workpiece, such programmer comprising a cam, a follower operably associated with said cam and the grinding wheel for moving the grinding wheel with respect to the workpiece in response to rotation of said cam, a disc operatively associated with said cam for rotation in synchronization with said cam, a motor operably connected with said cam and said disc for rotating said cam and said disc in synchronization with said cam, at least two dogs releasably carried by said disc in angularly spaced apart relation thereon, a switch constructed and arranged to be actuated by said dogs, and control means responsive to actuation of said switch and operatively associated with said motor to stop rotation of said cam and said disc by said motor in response to actuation of said switch by each of said dogs such that the number of increments in which the grinding wheel is advanced toward the workpiece for removing material from the workpiece is a function of the number of dogs carried by said disc and the extent of the feed of the grinder wheel toward the workpiece for each increment is a function of the angular spacing of said dogs on said disc.

4,182,084

BLADE SHARPENER

Richard C. Friedenberg, P.O. Box 53, Spring Valley, N.Y. 10977

Filed May 2, 1978, Ser. No. 902,065
Int. Cl.² B24D *15/06*
U.S. Cl. 51—214 **2 Claims**



1. A sharpener for an electric razor, said electric razor including a body, a driven shaft extending therefrom, and a rotary blade assembly adapted for being driven by said shaft, said shaft including a main portion and an end portion on the main portion and defining a shoulder therewith, said rotary blade assembly including a central disc, spokes extending from said disc and blades on said spokes and extending a common distance from said disc, said end portion extending through said disc, with the disc against said shoulder, to an extent less than said common distance, said sharpener comprising a base and a cover, said base fitting telescopically into said cover, said cover including a collar adapted to abut against the body of said razor and to guide the shaft into said cover, said base including a cylindrical side wall adapted for being received into said cover and an end face closing the side wall at one end thereof and a projection on said end face and adapted for engaging against the end portion of said shaft, said sharpener further comprising a honing means on said end face, said projection extending from said end face to a level above said honing means and constituting a means for limiting the force with which the honing means engages said blades by engagement of said projection against the end portion of the shaft.

4,182,085

METHOD AND STRUCTURE FOR INSULATING A WALL OR CEILING

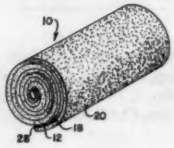
Jesse M. Elson, 138 E. Washington Ave., Pearl River, N.Y. 10965

Filed May 17, 1978, Ser. No. 906,781
Int. Cl.² E04G *9/10*
U.S. Cl. 52—2 **10 Claims**

1. Building insulation structure, which may be stored or shipped in rolled condition prior to being put in use to minimize heat transfer between opposite sides of a building wall, ceiling, or like member supported by studs or rafters along various areas thereof, said insulation structure comprising in combination:

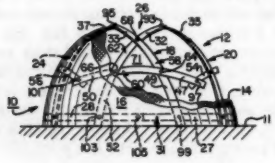
(a) an inflatable envelope of gas impervious material wherein said inflatable envelope includes at least two main wall portions;

(b) first discrete heat transfer barrier means substantially fully covering and secured to one of said main wall portions externally of said inflatable envelope;
(c) second discrete heat transfer barrier means substantially fully covering and secured to the other of said main wall portions externally of said inflatable envelope;
(d) means for separating said two main wall portions situated within the interior of said inflatable envelope and disposed between said two main wall portions; and



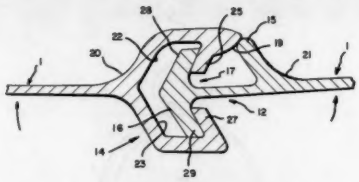
(e) valve means for facilitating entry of an inflating medium into said inflatable envelope and retaining an inflating medium within said inflatable envelope;
said separating means being a perforate sheet member having substantially the same overall dimensions as that of said two main wall portions separated thereby so that said insulation structure may be rolled into storage or shipping condition without adhesion of said two main wall portions to each other.

4,182,086
BUILDING CONSTRUCTION OF A-SHAPED ELEMENTS
Melvin Crooks, 1201 W. Church St., Champaign, Ill. 61820
Filed May 8, 1978, Ser. No. 903,816
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—81 **14 Claims**



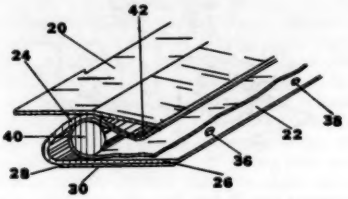
1. A building framework, comprising: a group of identical A-shaped basic building elements, each one of said building elements including first, second and third elongated strips of bendable material to enable it to flex so that the framework can assume various different shapes, said strips being connected together to form an A-shape defining a triangularly-shaped, centrally disposed opening and having the end portions of said strips forming first, second and third pairs of legs extending from the centrally disposed opening, said first and second strips being connected together and mutually intersecting at said first pair of legs and being connected and intersecting near their opposite ends in a spaced-apart manner to said third strip at said second and third pairs of legs to form the triangularly-shaped opening, each of said basic building elements being interconnected to a plurality of other building elements adjacent to the ends of the legs thereof.

4,182,087
SWIMMING POOL
Frederick R. Schall, Westmont, N.J., and Frank L. Kessler, Broomall, Pa., assignors to Esther Williams Swimming Pools, Delair, N.J.
Filed Apr. 24, 1978, Ser. No. 899,703
Int. Cl.[2] E02D *27/00*
U.S. Cl. 52—169.7 **12 Claims**



7. A swimming pool wall formed from extruded aluminum panels comprising:
(a) a plurality of interleavable panels, each panel having a pair of parallel edges, one of said edges defining a male joint member and the other of said edges defining a female joint member, each said male joint member being loosely and lockingly longitudinally interleavable with an adjacent female member when said adjacent panels have a first predetermined orientation relative to each other, and
(b) rigid locking means secured to each said panel external of said male and female joint members and responsive to rotation of an adjacent pair of panels in a predetermined direction relative to each other for placing said interleaved male and female joint members in a second predetermined orientation and in rigid locking intimate contact with each other.

4,182,088
INTERIOR MOUNTED WINDOW BARRIERS AND CHANNEL MEMBERS THEREFOR
Duane L. Ball, 6654 Shenandoah Dr., Reynoldsburg, Ohio 43068
Filed Mar. 23, 1978, Ser. No. 889,348
Int. Cl.[2] E04B *5/52*; E06B *3/28*
U.S. Cl. 52—202 **7 Claims**

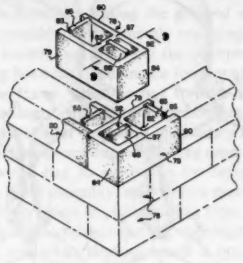


1. A channel member for attachment to the frame of a building closure such as windows, doors and the like for retaining a window barrier, said channel member comprising a relatively flat leg for sealing against said frame and a relatively thin, substantially incompressible, flexible generally smoothly curved sheperd's crook-shaped leg integrally formed as a continuous extension of and attached to said flat leg and forming a longitudinal channel which opens substantially parallel to said flat leg and which is resiliently spreadable.

4,182,089
INTERLOCKING BUILDING BLOCK

Harry M. Cook, Box 11886, Reno, Nev. 89510

Filed Oct. 31, 1977, Ser. No. 846,983
Int. Cl.[2] E04B 2/16, 1/02; E04C 1/10
U.S. Cl. 52—284 3 Claims



1. In an interlocking building block for the construction of walls and similar structures, which block includes a pair of spaced upright sidewalls extending between first and second ends and parallel upper and lower surfaces, and which structures include a first linear course of said blocks placed first end to second end and a second linear course of said blocks placed first end to second end upon said first course, the blocks of said second course being staggered with respect to the blocks of said first course, improvements therein comprising:

(a) a first upright web extending laterally across said block between said sidewalls and having a main body portion that is co-extensive in height with said sidewalls;

(b) a second upright web extending laterally across said block between said sidewalls; having a main body portion that is co-extensive in height with said sidewalls and spaced from said first web, said first web being spaced from the first end of said block a distance equal to one-half the distance between said first and second webs said second web constituting an end wall at the second end of said block;

(c) a third upright web constituting the second end of said block and spaced from said second web a distance equal to the spacing between said first and said second webs; said third web having a main body portion co-extensive with said sidewall and a projection extending upwardly from said third web beyond the upper surface of said block;

(d) a projection extending upwardly from the main body portion of said first web beyond the upper surface of said block, said projection having a length corresponding to the distance between said sidewalls and having a thickness less than the distance between said first and second webs; and wherein said third web is spaced from said second web of said block a distance equal to one-half the distance between said web and first end of said block;

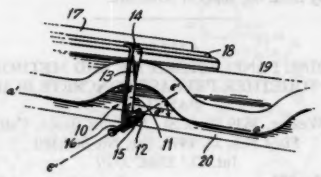
whereby the projection of a said block of said first course is re-received between the sidewalls and between the first and second web of a said block of said second course, and whereby said block of said second course is laterally located and longitudinally adjustable relative to said block of said first course.

4,182,090
ROOF TILE FASTENING CLIP

Raymond J. Aarons, Jindalee, Australia, assignor to Monier Colourtile Pty. Ltd., Darra, Australia

Continuation-in-part of Ser. No. 881,019, Feb. 24, 1978, abandoned, which is a continuation of Ser. No. 685,046, May 10, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 918,821
Int. Cl.[2] E04B 7/00
U.S. Cl. 52—489 4 Claims

1. A roofing tile clip for use in affixing roofing tiles to a roofing structure; said roofing structure having a tiling batten disposed to support said tiles thereon, said batten having a first longitudinal axis a'—a'; a lower tile supportable by said batten having an upper part; an upper tile having a lower side portion, said upper part being overlappable by said lower side portion of said upper tile; said roofing tile clip for securing said upper tile to a planar surface of said batten, having first and second ends being normally upper and lower ends respectively; said first and second ends being of unitary construction and forming opposite ends of a central body portion of said clip; holding means at said normally upper end of said clip disposed for

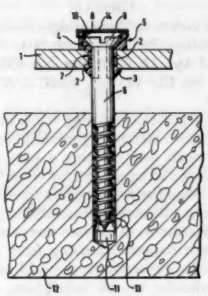


engaging said lower side portion of said upper tile; fixing means for securing said normally lower end of said clip to said batten, and wherein: said clip includes an integral foot having a second longitudinal axis c'—c' and extending laterally towards said batten, first and second apertures coaxial with and spaced from one another along a third axis e'—e' and being formed in said foot, said fixing means including a captive nail engaged in, and frictionally constrained against movement through said apertures in said foot, the axis of the apertures and of the foot being formed at an angle e with respect to the first longitudinal axis a'—a' and at an incline f with respect to a plane formed by said batten surface.

4,182,091
MOUNTING ARRANGEMENT

Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3 (Tümlingen), Fed. Rep. of Germany

Filed Feb. 17, 1978, Ser. No. 878,741
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712670
Int. Cl.[2] E04B 1/38
U.S. Cl. 52—508 9 Claims



1. A mounting arrangement for mounting an object to a support structure at a predetermined distance from the latter, comprising a sleeve-shaped dowel having an inner hole and insertable into a hole of the support structure; a mounting screw adapted to pass through a hole of the object to be mounted so as to support the latter, and partially insertable into said inner hole of said dowel, said mounting screw having a leading end and a trailing end as considered in the direction of insertion thereof into said dowel, and a head provided at said

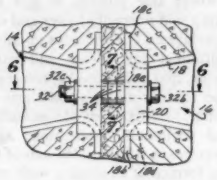
trailing end; and a sleeve-shaped spacer member having an inner hole adapted to be fitted onto said mounting screw and insertable into the hole of the object to be mounted, said spacer member having resiliently yieldable means adapted to be spring-loaded after insertion of said spacer member into the hole of the object to be mounted and operative for gripping the object to be mounted from a surface facing toward the support structure, when said spacer member is inserted in the hole of the latter, said spacer member having an upper portion lying on a surface of the object to be mounted, which faces away from the support structure, and provided with a ridge overlapping an end surface of said head of said mounting screw, which faces away from the support structure.

4,182,092

BUILDING PANEL CHORD TIE AND METHOD OF TIEING TOGETHER PRECAST CONCRETE BUILDING PANELS

Floyd E. Weaver, 3839 Birch St., Newport Beach, Calif. 92660

Filed Feb. 23, 1978, Ser. No. 880,380
Int. Cl.[2] E04C *3/20*
U.S. Cl. 52—583 **6 Claims**



1. A chord tie for concrete building panels comprising in combination,

an elongated anchor member formed at one end with a reversely-bent portion and at the other end being bifurcated to provide a pair of spaced coplanar portions having means for anchoring said member to a form,

and bolt-retaining means attached to said other end of said anchor member comprising a pair of straps individually welded to opposite sides of said coplanar portions to receive and retain a fastening bolt.

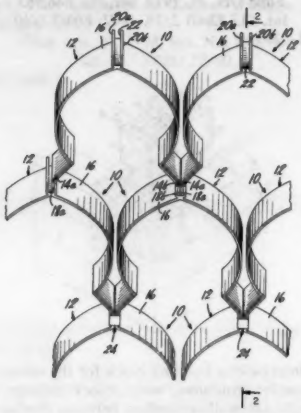
4,182,093

GRILLE

Alexandra A. Porumbescu, Woodbridge, N.J., assignor to Construction Specialties, Inc., Cranford, N.J.

Filed Apr. 12, 1978, Ser. No. 895,642
Int. Cl.[2] 403 *381;* **E04C** *2/42*
U.S. Cl. 52—663 **8 Claims**

1. A piece for a grille comprising walls having (1) spaced-apart parallel edges extending generally in the lengthwise direction of the walls and defining a base plane and, (2) a portion intermediate the edges spaced from the base plane in one direction, an edge flange extending from each edge of the walls of the piece in a direction generally perpendicular to the base plane and opposite from the said one direction, and a pair of spaced-apart slot flanges extending from the intermediate portion of the walls generally in the said one direction and generally perpendicular to the base plane, the slot flanges defining between them a dovetail mortise that opens generally away from the base plane and that extends lengthwise of the intermediate portion along an axis parallel to the said edges of the walls, said mortise being open at at least one lengthwise end thereof, each edge flange having a size and shape in transverse cross section that is substantially the same as the size and shape in transverse cross section of that part of the dovetail mortise which is located on the opposite side from such edge flange of a medial plane of the mortise generally perpendicular to the base plane, the faces of the mortise and the faces of the respective edge flanges nearest each other being substantially complementary such that each edge flange defines one-half of a dovetail tenon, and the piece being unitary and of uniform



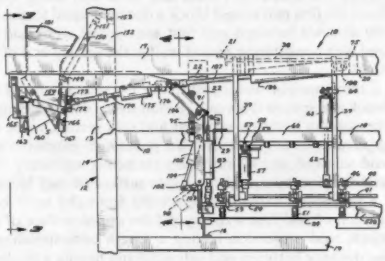
transverse cross section along an axis parallel to the said edges of the walls.

4,182,094

BAG OPENING AND FILLING APPARATUS

Gaylerd M. Lieder, and Richard H. Ayres, both of Minneapolis, Minn., assignors to Bemis Company, Inc., Minneapolis, Minn.

Filed Mar. 15, 1978, Ser. No. 886,800
Int. Cl.[2] B65B *57/02, 43/30*
U.S. Cl. 53—67 **34 Claims**



1. In apparatus for removing an unopened flat folded bag, which includes opposite first and second side walls that have edge portions which at least in part define an openable bag mouth, from a magazine and filling the bag, a frame, bag support means on the frame for supporting an unopened bag, operable bag pick-up means mounted on the frame for movement between a bag pick-up position to pick up an unopened bag from the magazine and a bag release position to release the pick-up bag to be supported by the bag support means, the pick-up means including an elongated swing arm having a first end portion and a second end portion, an elongated horizontal shaft having the swing arm first end portion mounted thereon for pivotal movement about a horizontal axis, means for mounting the shaft on the frame, vacuum cup means for picking up a bag from the magazine, arm means having a first end portion pivotally mounting the cup means and a second end portion, means for pivotally mounting the arm means on the swing arm second end portion, power means mounted on the frame and connected to one of the means for pivotally mounting the arm means and the swing arm for moving the swing arm between a bag pick-up position adjacent the magazine and

a bag release position remote from the magazine, and power means mounted on the swing arm for moving the arm means relative the swing arm to move the cup means between a lowered bag pick-up position and an elevated position, operable bag opening means at least in part mounted on the frame for gripping the opposite bag side walls of a bag on the bag support means, moving the gripped side walls to open the bag mouth and subsequently releasing the gripped side walls, an operable spout assembly for clampingly engaging a bag having an opened bag mouth, and releasing the clampingly engaged bag after the bag has been filled, means for mounting the spout assembly on the frame, operable bag transfer means on the frame for supportingly engaging the opened bag to retain the bag mouth open and after the bag is released by the bag opening means move the opened bag off the bag support means and transfer the opened bag to a position for being clampingly engaged by the spout assembly, and control means for operating the bag pick-up means to pick up a bag from the magazine and then release it, then operate the bag opening means to open the bag mouth, and while the bag mouth is open operate the bag transfer means to supportingly engage the bag and after the bag opening means releases the opened bag, move the opened bag to the spout assembly for being clampingly engaged by the spout assembly and operate the spout assembly to clampingly engage the opened bag after the bag has been moved to the spout assembly by the bag transfer means.

4,182,095

PACKAGING BULK COMMODITIES

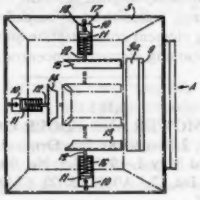
Timothy T. Day, 197 Vallance Rd., Bethnal Green, London, England

Division of Ser. No. 782,087, Mar. 28, 1977, Pat. No. 4,132,048. This application May 16, 1978, Ser. No. 906,383

Claims priority, application United Kingdom, Mar. 29, 1976, 12594/76

Int. Cl.[2] B65B *31/02*

U.S. Cl. 53—86 **8 Claims**



1. An apparatus suitable for packing bulk commodities into vacuum sealed plastic bags made of a laminate material formed of two films of plastic material of different softening points comprising a lower closure member to receive a loaded bag of said plastic laminate, a lid or hood member to close said closure member and form a chamber, heat sealing means disposed when said chamber is closed to engage the mouth of the loaded bag, heating means in said chamber and disposed out of contact with an unsealed loaded bag in said chamber, evacuation means to apply reduced pressure to the interior of said chamber and to the interior of said loaded bag, means to actuate said heat sealing means to seal said evacuated loaded bag, means to maintain operation of said evacuation means to cause said sealed bag to expand towards said heating means to soften the inner laminate of the plastic film of the material of said bag, and means to create a positive pressure in said chamber to cause said bag to collapse on the commodity in said bag and to make intimate surface contact with said commodity, said heating means urged by resilient means towards the expanding loaded sealed bag when said hood member is closed onto said lower closure member.

4,182,096

MACHINE FOR WRAPPING LIGHT OBJECTS, FOR EXAMPLE PAPER CUPS, IN FLEXIBLE PLASTICS WRAPPERS

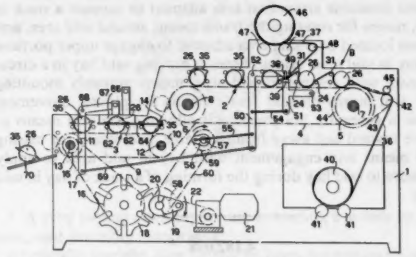
Aris Ballestrazzi; Lamberto Tassi, and Gianni Tosarelli, all of Vignola, Italy, assignors to Sitma S.p.A. Societa Italiana Macchine Automatiche, Spilamberto, Italy

Filed Mar. 17, 1978, Ser. No. 887,775

Claims priority, application Italy, Mar. 31, 1977, 21964 A/77

Int. Cl.[2] B65B *9/02*

U.S. Cl. 53—553 **3 Claims**



1. A wrapping machine, comprising an intermittently operated conveyor with a succession of cells for containing objects to be wrapped, a lower flexible plastics film fed below said objects and over an initial portion of a horizontal working branch of said conveyor, an upper flexible plastics film fed from above towards a predetermined region of said working branch of the conveyor, and welding and cutting means operating in said predetermined region for joining said films together between one cell and another by welding together with a double weld and cutting in an intermediate position, wherein at least one upper closing arm carrying an idle roller for said lower film is associated with each conveyor cell, there being provided resilient means for retaining said arm in its closing position, first cam means arranged to act on a portion of said arm to cause a momentary displacement thereof into its opening position when the cell with which it is associated passes into a loading region for the objects to be packaged upstream of said film joining region, and second cam means arranged to act on a portion of said arm to cause a further momentary displacement thereof into its opening position when the cell with which it is associated passes into a discharge region for the packaged objects downstream of said film joining region.

4,182,097

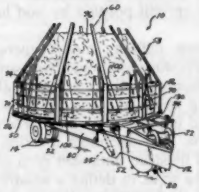
MACHINE AND METHOD FOR STACKING HAY

Donald L. Henke, Creston, Nebr., assignor to Veda, Inc., Long Lake, Minn.

Division of Ser. No. 546,385, Feb. 3, 1975, Pat. No. 4,022,004. This application May 6, 1977, Ser. No. 794,559

Int. Cl.[2] A01D *91/00*

U.S. Cl. 56—1 **35 Claims**



9. A method of making a stack of hay with a machine having a fixed platform with an upper surface for receiving a supply of

hay and supporting a stack of hay comprising: moving hay to the upper surface of the platform, moving the hay on said upper surface of the platform relative to said upper surface in a circular path to form a stack of hay from the bottom up, applying driving pressure in a downward direction on top portions of the hay on the platform during movement of the hay in said circular path on said platform, said pressure on the top portions of the hay being decreased as the height of the stack of hay is increased, and removing the completed stack of hay from the platform.

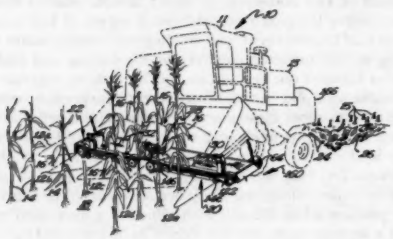
17. Structure for applying pressure to portions of a stack of hay during the forming of the stack of hay comprising: frame means locatable around an area adapted to support a stack of hay, means for rotating the frame means around said area, arm means located over said area adapted to engage upper portions of hay in said area, said arm means moving said hay in a circular path with respect to said area, means movably mounting said arm means on said frame means for pivotal movement about a generally horizontal axis allowing the arm means to move toward and away from said area, and means for biasing said means into engagement with hay in said area to apply pressure to said hay during the forming of a stack of hay in said area.

4,182,098

APPARATUS AND METHOD FOR HARVESTING AND WINDROWING CORN

Kenneth J. Kass, Rte. 2, Box 156, Tracy, Minn. 56175

Filed Jun. 10, 1977, Ser. No. 805,276
Int. Cl.[2] A01D *45/02, 57/00, 55/24*
U.S. Cl. 56—14.5 **25 Claims**



1. A corn harvesting apparatus usable for harvesting standing cornstalks rooted in the ground and having attached ears of corn while saving most corn plant residue resulting from husking of the ears so as to reduce crop loss comprising:

a corn harvesting implement having a power source and corn harvesting heads on the implement for engaging the standing cornstalks, removing the ears from the stalks and husking the ears, and having a corn plant residue discharge aperture for discharge of corn plant residue resulting from husking;

cornstalk cutting means energized by said power source and operatively positioned below said corn harvesting heads and above the ground and cooperating with said harvesting heads to sever standing cornstalks while the stalks are retained in an upright position by said harvesting heads; and

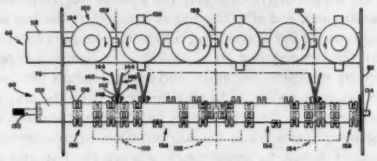
cornstalk windrow defining means operatively mounted below said harvesting heads and rearwardly of said cornstalk cutting means to collect severed stalks as they leave said harvesting heads and to direct the stalks laterally relative to said implement to a predetermined stalk discharge location, said discharge location positioned forwardly of and lined up with said corn plant residue discharge aperture so as to define a windrow of such corn stalks along the path of the implement and with the windrow positioned beneath said discharge aperture so that corn plant residue from said implement drops downwardly from said aperture onto the windrow and is supported on and retained by the windrow for curing.

4,182,099

IMPELLER MOWER-CONDITIONER ROTOR

Wilbur M. Davis; Bobby G. Sawyer, both of Ottumwa, Iowa, and John A. Nichols, Brookston, Ind., assignors to Deere & Company, Moline, Ill.

Filed Nov. 21, 1977, Ser. No. 853,035
Int. Cl.[2] A01D *43/00*
U.S. Cl. 56—16.4 **7 Claims**



1. In a mobile impeller type mower-conditioner for cutting standing crop material, conditioning it and depositing it in a windrow, said mower-conditioner having a transversely extending cutting means having opposite ends and tending to concentrate cut material in a generally rearwardly directed stream, and a frame, an improved impeller rotor disposed to receive crop material from the cutting means comprising:

an elongated core rotatably mounted in the mower-conditioner frame and having a transversely disposed axis of rotation generally parallel to the cutting means; and

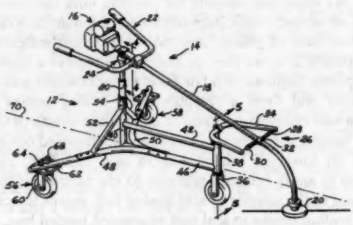
an uninterrupted array of generally radially extending conditioning elements carried by the core, spaced axially and circumferentially and extending substantially from end to end of the cutting means for engaging the crop material delivered by the cutting means, the spacing between said conditioning elements being reduced on a portion of the core approximately aligned with the rearwardly directed stream of crop material so as to define a zone of high conditioning element concentration and adjacent zones of lower conditioning element concentration.

4,182,100

LAWN MOWER AND EDGER CARRIAGE

Joseph D. Letter, 2 Breezeway Dr., Ormond Beach, Fla. 32074

Filed May 1, 1978, Ser. No. 901,807
Int. Cl.[2] A01D *53/00, 67/00*
U.S. Cl. 56—16.7 **10 Claims**



1. A wheeled carriage for a grass cutter comprising

a frame having ground engaging wheels,

first means for mounting said grass cutter on said frame for pivotal movement,

second means spaced from the first means for mounting said cutter on said frame for vertical, horizontal, and tilting movement with respect to said frame,

one of said mounting means normally maintaining a cutting

head of the cutter parallel to the surface traversed by the wheels, and

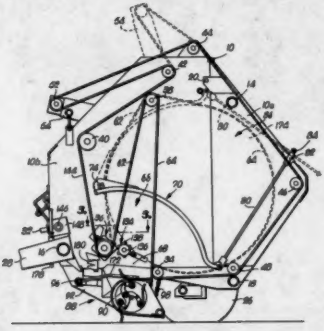
handle means secured to said cutter for pivoting the cutter, and moving the cutter vertically, and horizontally, in response to movement of the handle means by the cutter operator.

4,182,101

MACHINE FOR COILING FIBROUS CROP MATERIALS INTO LARGE ROUND BALES

Melvin V. Gaeddert, Newton, and Bobby D. McWhirt, Hesston, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Dec. 1, 1977, Ser. No. 856,416
Int. Cl.[2] A01D *39/00*
U.S. Cl. 56—341 **15 Claims**



1. In a machine for rolling crop materials into cylindrical bales, wherein said rolling takes place entirely off the ground, the improvement comprising:

a vertically disposed, expandable chamber having a pair of initially generally vertically disposed web stretches defining opposed portions of the chamber and disposed to deflect laterally as the bale grows in size whereby to enlarge the chamber,

said stretches being drivable in opposite linear directions so as to impart a rolling action to material contained within the chamber;

means across the top of said chamber and spanning said stretches for limiting the upward movement of materials being acted upon in the chamber;

a pair of guide members adjacent the lower end of said chamber and spaced apart in a fore-and-aft direction relative to the path of travel of the machine,

said stretches being trained around respective ones of said members; and

a crop pickup mounted below said members and between the same in a fore-and-aft direction for lifting crop materials off the ground and feeding the same directly up into said chamber in an upwardly flowing stream,

said pickup and said members cooperating to define an open throat through which materials may flow freely into said chamber without substantial compaction or clogging,

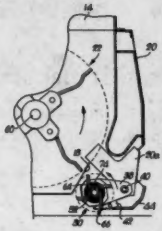
said stretches being linearly spaced portions of the same web.

4,182,102

CROP PICKUP ASSEMBLY

John D. Anderson, Canton; Adin F. Holdeman, Hesston, and Dwight C. Moddelmog, Canton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Sep. 29, 1977, Ser. No. 837,506
Int. Cl.[2] A01D *89/00*
U.S. Cl. 56—344 **9 Claims**



1. A crop pickup assembly for use in loading a mobile receptacle, said assembly comprising:

a generally upright duct having an open bottom and a crop outlet at the upper end thereof;

a primary conveying rotor disposed entirely within said duct immediately above said open bottom for drawing a stream of air upwardly through said open bottom and propelling the same with crop materials upwardly through the duct and into the receptacle; and

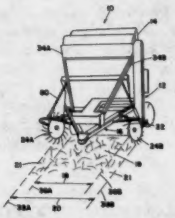
a secondary pickup rotor situated generally below said primary rotor in position to lift crop materials off the ground and feed the same up through said open bottom to said primary rotor for said propulsion thereby.

4,182,103

WINDOW TUCKER WHEELS

Darrell A. McNutt, Hwy. 70 East, Soper, Okla. 74759

Filed Jul. 15, 1977, Ser. No. 816,514
Int. Cl.[2] A01D *43/02*
U.S. Cl. 56—364 **4 Claims**



1. For use with a hay baler having means for picking up hay from a windrow on a field, the baler having a frame with a drawbar extending forwardly of the hay pickup means, the improvement providing apparatus for reducing the width of the windrow, comprising:

a pair of tucker wheels, each having a front and rear side and having a plurality of flexible wire spokes extending out beyond the circumference of the wheel;

a pair of V-shaped wheel supports having the inner ends attached to opposite sides of the baler drawbar by universal means permitting the wheel supports to move both vertically and horizontally, the outer end of each wheel support being rotatably attached to the rear side of a tucker wheel, the intermediate V portion of each wheel support extending forwardly of each tucker wheel in the

forward direction of the baler, the point of attachment of the inner end of each wheel support being forward of the trailing edge of the tucker wheel rotatably secured to the wheel support;

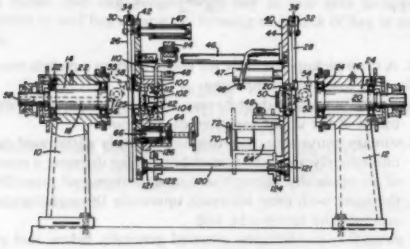
adjustable means to limit the downward and rearward pivotation of each wheel support whereby as the baler moves forwardly the forward side of each tucker wheel is positioned at an outwardly inclined angle to either side and forward of the baler hay pickup means to move hay towards the path of the baler pickup means.

4,182,104

DOUBLE TWIST WIRE BUNCHER

Vincent F. Sukle, Oakwood Village, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sep. 11, 1978, Ser. No. 941,335
Int. Cl.[2] D07B *3/12;* D01H *7/86*
U.S. Cl. 57—58.52 **8 Claims**



1. In a double-twist wire bunching machine having a creel onto which a plurality of individual wire spools are rotationally mounted, an orifice through said creel through which all the wires are drawn and gathered, a pair of flying sheaves adapted to rotate in unison around said creel while the gathered wire strands are drawn thereover, the improvement comprising a creel consisting of at least one vertically disposed plate, a plurality of spaced and independent hubs mounted on said plate each adapted to receive an individual wire spool such that the spool axes are horizontal, at least one brake shoe assembly adjacent to each hub adapted to apply a brake pressure onto the associated hub, sensing means associated with one of said hubs for sensing the amount of wire on a spool mounted on said hub, and tensioning means responsive to said sensing means to uniformly apply the brake pressure to each hub in proportion to the amount of wire on said spool such that the brake pressure on the hubs is gradually and uniformly reduced as the amount of wire on said spool is reduced.

4,182,105

METHOD OF MANUFACTURING COLLECTIVELY STRANDED WIRES FOR COMMUNICATION CABLES

Yoshida Tokuji, Tokyo, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1978, Ser. No. 909,906
Int. Cl.[2] H01B *13/02*
U.S. Cl. 57—58.54 **2 Claims**

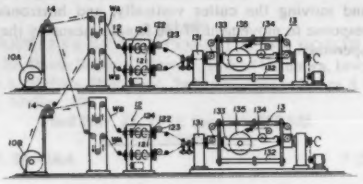
1. A method, for the manufacture of collective stranded wires for communication cables, comprising the steps of:

(i) preparing, by parallel extrusion, a plurality of multi-wire sets in which the wires are covered with insulating material, the insulating material of each multi-wire set being of a color which is different from the color of each other such multi-wire set, the number of multi-wire sets prepared being the same as the number of wires in each set;

(ii) dividing each multi-wire set into a plurality of individual wires each covered with said insulating material;

(iii) imparting pre-twist to each of said individual wires;

(iv) composing groups of said pre-twisted individual wires, each group including a pre-twisted individual wire having



its insulating material respectively of each of the colors, and

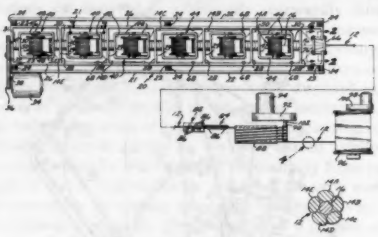
(v) severally stranding said groups.

4,182,106

ELASTICALLY DEFORMABLE WIRE

Michael E. Henry, Long Beach, Calif., assignor to Cablestrand, Long Beach, Calif.

Filed Jul. 5, 1978, Ser. No. 922,188
Int. Cl.[2] D07B *1/00;* D02G *3/12, 3/44;* A61C *7/00*
U.S. Cl. 57—212 **13 Claims**



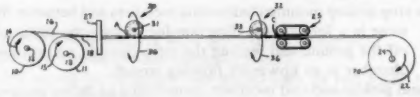
1. A wire construction in which five filaments of equal cross sectional area are helically disposed in overwound arrangement about a single center filament of cross sectional area larger than the cross sectional area of each surrounding filament, wherein said filaments are all formed of stainless steel, and the ratio of diameter of the stock from which said center filament is formed to the diameter of each of said surrounding filaments is no greater than 1.2:1, and the helical angle of disposition of said surrounding filaments about said center filament is between about 60° and about 65°.

4,182,107

METHOD OF FORMING S–Z TWISTED STRAND UNITS

Joe M. Carter, Lawrenceville; Clyde J. Lever, Jr., Norcross, and Gerald A. Scheidt, Atlanta, all of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 6, 1978, Ser. No. 957,772
Int. Cl.[2] H01B *13/04*
U.S. Cl. 57—293 **8 Claims**



1. A method of forming strands into twisted strand units having a twist direction that reverses from section to section wherein the strands are advanced side by side successively

through first and second mutually spaced twister heads and are formed into twisted strand units by the steps of:

(a) operating the twister heads by simultaneously revolving the twister heads in a common direction about the strands at substantially the same speed of head revolution thereby causing a first progression of twists of one direction to pass from the first twister head towards the second twister head and a second progression of twists of opposite direction to emanate from the second twister head;

(b) simultaneously terminating twisting operations of the first and second twister heads by terminating their revolutionary movement about the strands by reduction in the revolutionary speed of the twister heads as the leading end of the first progression of twists reaches the second twister head and a trailing end of the second progression of twists emanating therefrom;

(c) suspending twisting operations of the first and second twister heads until a trailing end of the first progression of twists reaches the second twister head; and

(d) sequentially repeating steps (a), (b), and (c).

4,182,108

ELECTRONIC TIMEPIECE CORRECTION CIRCUIT

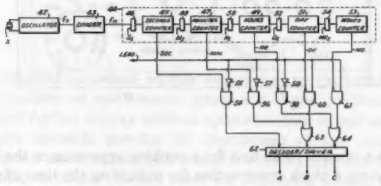
Hiroyuki Chihara, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Mar. 9, 1977, Ser. No. 776,083

Claims priority, application Japan, Mar. 9, 1976, 51-25334

Int. Cl.[2] G04B *19/24*; G04C *3/00*; G04B *27/00*

U.S. Cl. 58—4 A **12 Claims**



1. In an electronic timepiece including, time standard means for producing a time standard signal; a plurality of series-connected counter means for receiving said time standard signal, each of said series-connected counter means being adapted to produce a timekeeping signal representative of the count thereof; digital display means adapted to display a first type of time information in response to at least two of said timekeeping signals produced by first and second series-connected counter means being applied thereto, said digital display means being further adapted to display a second type of information in response to at least one further timekeeping signal produced by a third series-connected counter means being applied thereto; and display select means disposed intermediate said series-connected counter means and said digital display means, said display select means being normally disposed in a first display mode and selectively disposable into a second display mode in response to a changeover signal being applied thereto, said display select means being adapted in a first display mode to apply to said digital display means said at least two timekeeping signals produced by said first and second series-connected counter means, and being further adapted in a second display mode to apply to said digital display means said at least one further timekeeping signal produced by said third counter means, the improvement comprising; control means for selectively producing a control select signal; adjustment means for producing an adjustment signal; and mode select means disposed intermediate said control means and said series-connected counter means and display select means, said mode select means being coordinately disposable between a first mode and a second mode, said mode select means being adapted, when disposed in said first mode, to apply to said display select means a changeover signal in response to said control select signal being selectively applied thereto, said mode select means including counter select means for cyclicly selecting in sequence at least said first, second and third series-connected counter means in response to each selective application of a control select signal, when the mode select means is disposed in a second mode, said counter select means being further adapted when disposed in a second mode to produce said changeover signal in response to selection of said third series-connected counter means and to produce at least first and second counter means selecting signals in response to said control select signal being selectively applied thereto, and gating means disposed intermediate said counter select means and at least said first, second and third series-connected counter means, said gating means, in response to receiving one of said first and second counter select signals, being adapted to select one of said first and second counter means to receive said adjusting signal, said gating means being further adapted, in response to coincidentally receiving one of said first and second counter select signals and said changeover signal, to select said third counter means to receive said adjustment signal.

4,182,109

CALENDAR MECHANISM FOR TIMEPIECES

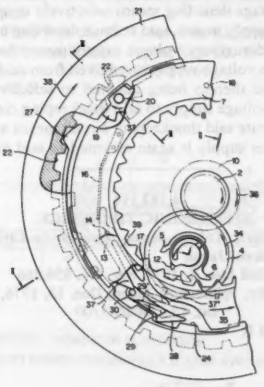
Kazuo Teramoto, Fuchu, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jul. 24, 1978, Ser. No. 927,399

Claims priority, application Japan, Aug. 22, 1977, 52-100327

Int. Cl.[2] G04B *19/24*

U.S. Cl. 58—4 R **6 Claims**

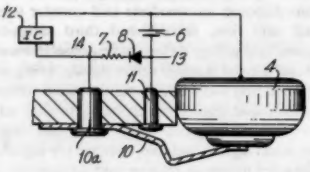


1. A calendar mechanism for timepieces comprising an annular date dial coaxial with the center of the timepiece and having a toothing, an annular month dial provided outside said date dial having a toothing, a driving member adapted to engage the toothing of said date dial for driving it one step every 24 hours, an auxiliary lever provided on said date dial having a pawl portion, an additional driving member adapted to be rotated one full turn every 24 hours, a month dial driving device for driving said month dial one step during the rotation of said date dial between the indications "31" and "1," and cam means provided on said month dial to bias said auxiliary lever toward said additional driving member to engage the pawl portion of the auxiliary lever with said additional driving member in the end of the even month, whereby said date dial may be driven two steps in the end of the even month by said driving member and said additional driving member.

4,182,110
ELECTRONIC WRISTWATCH INCLUDING AUXILIARY POWER SUPPLY

Osamu Kamiwaki, and Wataru Onishi, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 27, 1977, Ser. No. 864,288
Claims priority, application Japan, Dec. 27, 1976, 51-158892
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 BA **16 Claims**

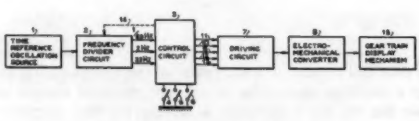


1. In an electronic wristwatch including a high frequency time standard capable of vibrating at a high frequency, timekeeping circuit means coupled to said high frequency time standard for converting the high frequency of vibration of said time standard to low frequency timekeeping signals representative of actual time, display means coupled to said timekeeping circuit means for displaying time in response to said low frequency timekeeping signals applied thereto, and a main power supply coupled to said timekeeping circuit means and said display means for delivering a voltage of a sufficient level to operate said timekeeping circuit means and display means, the improvement comprising an auxiliary voltage supply adapted to selectively deliver to said timekeeping circuit means a voltage of a sufficient level to operate said timekeeping circuit means and voltage detecting means selectively coupled to said main voltage supply means, said voltage detecting means being coupled to said auxiliary voltage supply means for detecting when said main voltage supply is removed from said timepiece, and in response thereto being adapted to selectively couple said auxiliary voltage supply to said timekeeping circuit means to thereby operate said timekeeping circuit means at least until said main power supply is again returned to said timepiece.

4,182,111
ELECTRONIC TIMEPIECE

Munetaka Tamaru, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1977, Ser. No. 856,266
Claims priority, application Japan, Dec. 13, 1976, 51-149581
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 R **9 Claims**

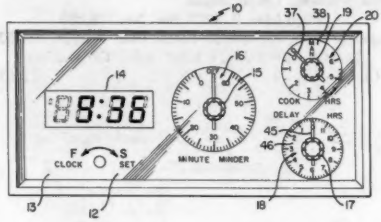


1. An electronic timepiece comprising
a. a high frequency time reference signal source for generating a time reference signal;
b. a frequency divider circuit for dividing the frequency of said time reference signal and delivering a time unit signal and time correction signals;
c. a control circuit connected to said frequency divider circuit such that said control circuit receives as an input a plurality of time correction signals from said frequency divider circuit;
d. an exteriorly operable switch means connected to said control circuit and causing said control circuit to select said time correction signals;
e. a driving circuit receiving as an input the output signal from said control circuit;
f. a reversibly rotable electro-mechanical converter for effecting electro-mechanical conversion of a driving signal from said driving circuit;
g. a gear train-time display mechanism receiving an output from said electro-mechanical converter so as to set times of the timepiece; and
h. said frequency divider circuit is reset by a reset signal supplied from said control circuit.

4,182,112
CONTROL PANEL UNIT AND TIMER UNIT AND METHOD THEREFOR

Robert Strachan, Wolcott, and Carl J. Goodhouse, Litchfield, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 26, 1978, Ser. No. 872,610
Int. Cl.² G04F *3/06*
U.S. Cl. 58—39.5 **20 Claims**



1. In a control panel unit for a cooking apparatus or the like and having a clock construction for indicating the time of day and a timer control means for selecting a delay time period and a cooking time period for causing said apparatus to provide a cooking operation for said cooking time period following the elapsing of said delay time period, the improvement wherein said clock construction comprises an electronic clock means and said timer control means comprises electromechanical means operating independently of said electronic clock means.

4,182,113
ELECTRONIC TIME KEEPING DEVICE WITH TIME-SHARED TIMING INDICATOR

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 551,238, Feb. 20, 1975, abandoned, which is a continuation of Ser. No. 352,640, Apr. 19, 1973, abandoned. This application Apr. 12, 1978, Ser. No. 895,722
Claims priority, application Japan, Apr. 21, 1972, 47-40085
Int. Cl.² G04B *19/24*; G04C *3/00*; G04B *19/30, 27/00*
U.S. Cl. 58—4 A **18 Claims**

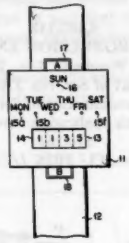
1. A multi-function electric timekeeping device for carrying out normal timekeeping as well as at least one additional functional operation other than normal timekeeping and time setting, comprising:
a pulse generator (**31**) for generating standard clock pulses;
counter means (**43, 28, 21, 22, 32**) coupled to said pulse generator for counting said standard clock pulses to provide outputs corresponding to different timings and to form a plurality of successive cycles each of a specific counted value;
a time indicating means (**15*a*–15*f*, 16, 13, 14**) having sections (**13, 14, 16**) for visually displaying at least hours and minutes, and a plurality of further sections (**15*a*–15*f***) for cyclically and visually displaying different timings correspond-

ing to the outputs of said counter means, the timings displayed by said further sections corresponding to times when different functional operations, comprising said at least one functional operation other than normal timekeeping, of the multi-function electric timekeeping device may be initiated;

decoding means (**45, 23, 24**) coupling said counter means to said time indicating means and selectively causing said time indicating means to display the contents of said counter means;

a manually operable member (**17**) to be operated by the user in accordance with the condition of the visual display at said plurality of further sections (**15***a*–**15***f*); and

an operation command signal distributing circuit (**47, 48, 49, 50**) coupled to receive inputs from said manually operable member (**17**), said operation command signal distributing circuit including a decoder coupled to said counter means for selectively generating one of a plurality of different



function command signals responsive to the counting condition of said counter means and to the condition of said further display sections upon actuation of said manually operable member for distributing to said counter means a command signal which is a unique function of the outputs of the counted value for displaying timings from said counter means when said manually operable member is operated, said command signals being different from the inputs received by said decoder of said disbributing circuit from said counter means, and at least one of said command signals designating a function other than a timekeeping and a time-setting function, said distributed command signal initiating a desired one of said additional functional operations of the multi-function timepiece in accordance with the timings displayed by said plurality of further sections (**15***a*–**15***f*) of said time indicating means so that a respective functional operation is initiated in response to each distributed signal.

4,182,114

TIME-PIECE WITH ELECTRIC MOTOR DRIVEN DISPLAY AND PLANETARY MOTION WORK

Pierre-Luc Gagnebin, Bienne, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

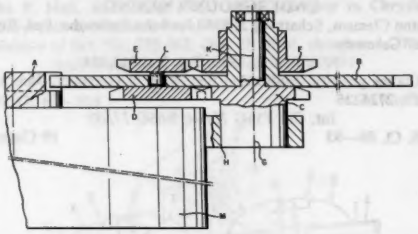
Filed Jul. 11, 1977, Ser. No. 814,566

Claims priority, application United Kingdom, Jul. 12, 1976, 28844/76

Int. Cl.[2] **G04B** *33/00*

U.S. Cl. 58—59 **8 Claims**

1. A wristwatch movement including an electric motor arranged to transmit motion to a minute hand and an hour hand wherein the motion work comprises a planetary train having a central minute wheel directly driven from the motor, said central minute wheel bearing a pair of eccentrically located coaxial planet pinions which are fixed for rotation together and



one of which engages a fixed central gear and the other of which engages an hour wheel.

4,182,115

ELECTRONIC WRISTWATCH EMPLOYING A FLEXIBLE FILM SUBSTRATE

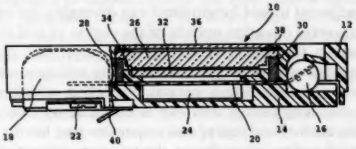
Toshiyuki Masuda, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Sep. 20, 1977, Ser. No. 834,876

Claims priority, application Japan, Sep. 20, 1976, 51-113283

Int. Cl.[2] **G04B** *37/00*

U.S. Cl. 58—88 R **12 Claims**



1. An electronic timepiece comprising:

a first support means containing a digital display on a surface threof;

a second support means provided in a spaced relationship with said first means;

said first and second support means provided for accommodating a discrete module of the electronic timepiece implemented with a semiconductor element;

a flexible film substrate carrying said semiconductor element of said electronic timepiece and wiring patterns;

means for tightly sandwiching said flexible film substrate between a portion of said digital display carrying said first support means and a portion of said second support means for holding purposes, said flexible film substrate being held in direct contact with each of said portions of said first and second support means;

a resilient means for holding said flexible film substrate; and

said resilient means functioning to provide electrical interconnection between the digital display and said wiring patterns of said flexible film substrate.

4,182,116

CONNECTING ELEMENT FOR LINK CHAIN STRANDS OF PLOUGH OR CONVEYOR CHAINS EMPLOYED IN UNDERGROUND MINING

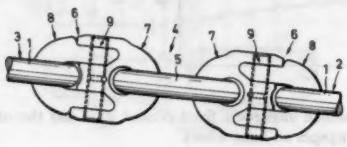
Anton Clement, Schattweg 3, 5860 Iserlohn-Letmathe, Fed. Rep. of Germany

Filed Jun. 7, 1978, Ser. No. 913,034

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726235

Int. Cl.² F16G *15/04*; B65G *17/00*

U.S. Cl. 59—93 **19 Claims**



1. A connecting element for connecting two link chain strands, particularly of plough or conveyor chains employed in underground mining, comprising a central oval chain member; two coupling links each having a longitudinal axis and two axial ends, each of said coupling links being connected with said central chain member at one axial end and with one of the link chain strands at the other axial end, each of said coupling links including a base part having a plurality of grooves extending in an axial direction and a through bore through which said central chain member extends, and a U-shaped suspension part having a plurality of legs extending also in the axial direction and form-lockingly engaging in said grooves of said base part; and a coupling bolt extending through said parts in a direction transverse to said axial direction and arresting said parts with each other, said base part having a front end face facing toward said suspension part, each of said grooves of said base part extending from said front end face through the region of said coupling bolt and then substantially up to the region of an axis of said through bore, piercing said base part over its entire thickness and being bounded by substantially parallel side walls extending in said axial direction, the side walls located adjacent to said longitudinal axis diverging outwardly in the transverse direction outside of the region of said coupling bolt and in the region of said through bore, said base part having a plurality of projections bounding said grooves therebetween and including a central projection which extends along said longitudinal axis and is bounded by two of said grooves, each of said legs of said suspension part having a cross section, in a plane extending in the transverse direction along an axis of said coupling bolt, which transmits tensile strength and substantially corresponds to the cross section of said central projection of said base part.

4,182,117

DIFFUSER VANE CUSP BLEED APERTURE WITH AUTOMATIC EJECTOR CONTROL DEVICE

John T. Exley, Milford, and Charles Kuintzle, Monroe, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Jan. 9, 1978, Ser. No. 867,893

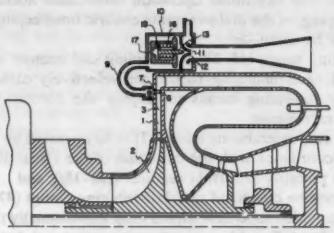
Int. Cl.² F02C *7/32*; F04B *23/08*

U.S. Cl. 60—39.07 **3 Claims**

1. In a gas turbine engine having a compressor stage which drives high energy airflow through a diffuser, means to bleed air from the diffuser comprising:

a plurality of diffuser vanes mounted in the diffuser and having a curved cusp-like surface formed in the trailing edge thereof;

a connecting duct constructed in the diffuser and communicating with the region within the cusp formed in the downstream end of the diffuser vane; and



a bleed air manifold constructed to receive bleed air from the connecting duct.

4,182,118

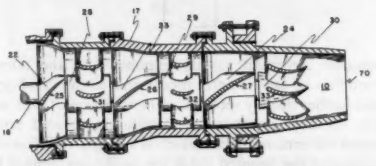
JET PROPULSION ENGINE

Bill M. Chronic, 2704 Woodlawn Ave., Boise, Id. 83702

Continuation-in-part of Ser. No. 376,251, Jul. 3, 1973, abandoned, which is a continuation of Ser. No. 135,267, Apr. 18, 1971, abandoned. This application Nov. 20, 1974, Ser. No. 514,162

Int. Cl.² F02K *1/22*

U.S. Cl. 60—221 **2 Claims**



1. In a jet propulsion engine, including a tapered housing comprising an entranceway at the larger terminal end thereof, a driven shaft journally along the rectilinear center line of said housing, a plurality of impellers having a multiplicity of blades issuing radially from said shaft, a plurality of stators juxtapositioned in said housing alternately between said impellers, said stators having a multiplicity of blades issuing radially from said housing fixation of said stators, the modification of said housing from an ideal geometrical developed tube which provides uniform acceleration of a fluid through said tube to a tube having any transverse section there taken provides an inside net fluid cross sectional area substantially equal to the area of said ideal tube in addition to the area occupied by the material thickness of the respective impellers or stators and said driven shaft at the respective cross section.

4,182,119

AIR PUMP FOR TURBOFAN FUEL CONTROL SYSTEM

John F. Hurley, Huntington, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Sep. 1, 1977, Ser. No. 829,652

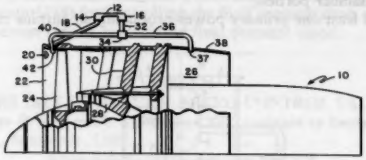
Int. Cl.² F02K *39/04*

U.S. Cl. 60—226 R **3 Claims**

1. For a fan type aircraft turbine engine utilizing a bypass air duct and having a fuel control assembly for scheduling engine fuel flow in response to varying conditions of aircraft altitude, speed and ambient air temperature, said ambient air temperature being measured from a sample of air taken via a small forward facing air scoop placed at the air intake of the engine and conveyed via conduit means to said fuel control assembly for bathing the inlet air temperature sensing probe therein with a continuously renewed sample of ambient air, the sample of

air being conducted away from the fuel control assembly via a second conduit which delivers the air sample to an aft facing nozzle directly in front of the forward compressor fan stage, the improvement comprising:

higher pressure air sampling means for obtaining bleed off air from the engine bypass air duct;



an air ejector pump having two inputs and an exhaust, said pump being powered via its first input by the higher pressure air sampling means, said second input in communication with the output of said fuel control assembly and serving to continuously draw ambient air samples therefrom; and

conduit means for delivering the exhaust from said air ejector pump to said aft facing nozzle.

4,182,120

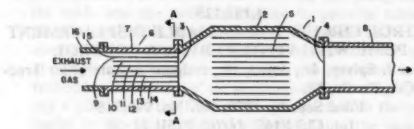
EXHAUST SYSTEMS

Leonard M. Niebylski, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 368,741, Jun. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 343,105, Mar. 20, 1973, abandoned. This application Mar. 10, 1977, Ser. No. 776,109

Int. Cl.[2] F01N *3/15*

U.S. Cl. 60—274 **14 Claims**



1. An exhaust system especially adapted for use with an internal combustion engine operating on gasoline containing a cyclopentadienyl manganese antiknock, said system comprising a catalytic reactor having an inlet and an oulet, said reactor containing a catalyst bed, said catalyst bed consisting essentially of a catalytic metal supported on a honeycomb monolithic ceramic support, said inlet being operatively connected to receive the exhaust gas from the exhaust outlet of said engine through exhaust conduit means, said system including a plurality of substantially parallel vanes spaced about 1/16–⅛" apart located in said exhaust conduit means at a position which is immediately upstream from said inlet, the surface of said vanes being substantially aligned with the longitudinal axis of said conduit means, said vanes functioning to inhibit the plugging of said catalyst bed by manganese compounds in said exhaust gas at temperatures above about 1400° F. said vanes being solely responsible for the inhibition of plugging which is obtained when said vanes are arranged immediately upstream from said inlet.

4,182,121

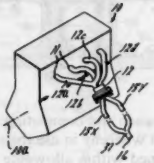
EXHAUST TUNING FOR TRANSVERSE AUTOMOBILE ENGINE

John F. Hall, Bloomfield Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 735,462, Oct. 26, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,491

Int. Cl.[2] F01N *7/10*; **F02B** *27/02*

U.S. Cl. 60—313 **16 Claims**



1. In an exhaust system for an automobile engine having a multiple sequentially operative exhaust port, a gas passage comprising an exhaust manifold which includes a plurality of separate conduits for connecting the exhaust ports with an outlet and for conducting exhaust gases therebetween and further comprising an exhaust header which includes a plurality of separate conduits extending from an inlet and for conducting exhaust gases from the outlet of the manifold to atmosphere, coupling means for connecting the outlet of said manifold with the inlet of said header to effect exhaust tuning for said engine by connecting selected conduits of said manifold at said outlet with selected conduits of said header at said outlet, said selective conduits of said header merging at a predetermined location downstream of said outlet, said exhaust tuning means comprising partition means at said coupling including a first partition at said outlet of the manifold separating the same into two outlet parts, said conduits of said manifold connecting two sets of non-consecutively operative exhaust ports of said engine with two outlet parts respectively, said partition means also comprising a second partition at said inlet of the header separating the same into two inlet parts, said partitions cooperatively engaging to connect one of the inlet parts with one of the outlet parts and connecting the other inlet part with the other outlet part, said coupling means comprising two coupling portions carried by said manifold and header respectively and having sealing surfaces interfitting in sliding sealing relation to effect an articulated connection between the manifold and header, the sealing surfaces of the coupling portion carried by one of the two members comprising said manifold and header being spherical about a center on a line parallel to the roll axis of the engine, resiliently yieldable means urging said sealing surfaces into sliding sealing relationship, flange means carried by said one member, said yieldable means having a yieldable portion engaging said flange means on said line.

4,182,122

INSULATED EXHAUST MANIFOLD

Michael K. Stratton; Karl R. Engquist, both of Peoria; Frank E. Keske, Chillicothe; Harold C. Powers, Peoria, and James D. Sparks, Edelstein, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

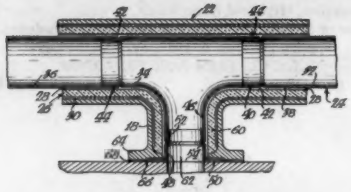
Filed Feb. 15, 1978, Ser. No. 878,141

Int. Cl.[2] F01N *7/10*

U.S. Cl. 60—322 **17 Claims**

1. An insulated manifold for an internal combustion engine having an outer casting with a plurality of integrally formed port branches extending sidewardly from said casting, an exhaust conduit in said casting and having integrally formed port stubs extending into said port branches, a preformed insulation member encircling said exhaust conduit and having integrally formed port stubs encircling said port stubs of said exhaust conduit and being disposed in said port branches of said cast-

ing, said insulation member being spaced from said exhaust conduit to provide a small air gap therebetween, and a sleeve



nesting in each port branch and connecting with said port stub of said exhaust conduit whereby in use the skin temperature of said casting is maintained within allowable limits.

4,182,123

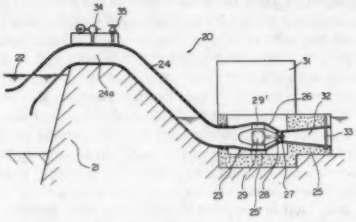
HYDRAULIC POWER PLANT

Tsuneo Ueda, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Jan. 18, 1978, Ser. No. 870,931

Int. Cl.[2] F16D *33/00*

U.S. Cl. 60—325 **4 Claims**



1. A hydraulic power plant comprising a reservoir having a dam wall, a water turbine and generator means connected thereto, said turbine being on the opposite side of the dam wall from the reservoir and below the level of the surface of the reservoir, and a penstock for supplying water from the reservoir to the water turbine, said penstock extending from the reservoir over the dam wall to the water turbine without passing through said dam wall, and vacuum pump means connected to said penstock at substantially the uppermost portion of the penstock for filling the penstock with water.

4,182,124

GRAVITY AUGMENTED AIR COMPRESSION TURBINE POWER PLANT

Robert A. Kraus, and Edmund J. Kraus, both of 14160 Redhill, #39, Tustin, Calif. 92680

Continuation-in-part of Ser. No. 763,498, Jan. 28, 1977, abandoned. This application Oct. 5, 1977, Ser. No. 819,967

Int. Cl.[2] F02C *1/02, 1/04*

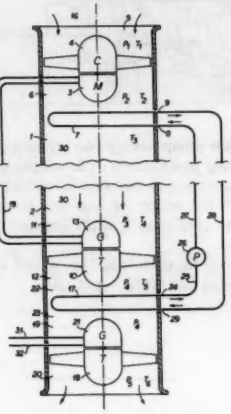
U.S. Cl. 60—398 **10 Claims**

1. A power-producing device, comprising a vertically oriented chamber having at least one air inlet at its upper end, and having at least one air outlet at its lower end; said chamber being of sufficient height to allow gravitational downward attractive force exerted on the steady downward-flowing column mass of compressed air within said chamber, to produce a gravitational energy potential in the form of increased column weight, which, when converted into work is sufficient to sustain the device's operation and to produce a substantial net generated power output; said device further comprises the following components, arranged in sequence from its upper to its lower end;

a. at least one air compressor means;

b. at least one aftercooler heat exchanger means located immediately downstream of said air compressor means having a cooled heat-transfer fluid inlet and a heated heat-transfer fluid outlet, said air compressor and said aftercooler heat exchanger means being fluid communicatively connected from atmosphere to within the upper chamber portion;

c. at least one primary power-producing air turbine means;



d. at least one air reheater heat exchanger means located immediately downstream of said primary air turbine means having a heated heat-transfer fluid inlet and a cooled heat-transfer fluid outlet;

e. at least one secondary power-producing, electric generator driving air turbine means located immediately downstream of said air reheater heat exchanger means; said primary air turbine, said air reheater heat exchanger and said secondary air turbine means being fluid communicatively connected from within the lower chamber portion to atmosphere.

4,182,125

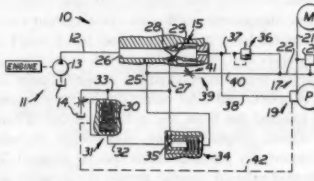
CONTROL CIRCUIT FOR VARIABLE DISPLACEMENT PUMP WITH VENTURI BYPASS CONTROL

William J. Spivey, Jr., Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 25, 1978, Ser. No. 945,748

Int. Cl.[2] F16D *31/02;* F15B *21/04*

U.S. Cl. 60—431 **7 Claims**



1. In a control circuit **(10)** of the type comprising a source of pressurized fluid **(11)**, variable displacement pump means **(17)** for having the displacement of a pump **(18)** thereof varied in response to communication of pressurized fluid thereto, an underspeed actuator **(31)** connected to a servo system **(19)** of said pump means for automatically controlling the displacement of said pump **(18)**, a venturi **(15)** interconnected between said source **(11)** and said pump means **(17)** and having a throat

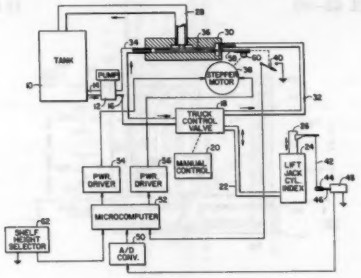
(29) and upstream side (26) thereof connected (25,27) to said underspeed actuator (31) for communicating a differential fluid pressure signal thereto for automatically controlling the displacement of said pump (18) and a pressure regulating valve (36) interconnected between a downstream side of said venturi (15) and said pump means (17), the improvement comprising bypass means (39) interconnected between a downstream side of said pressure regulating valve (36) and the upstream side of said venturi (15) for controlling the fluid pressure drop across said venturi (15) to control said fluid pressure signal.

4,182,126

FORK LIFT HYDRAULIC SERVO CONTROL VALVE

Thomas R. Blakeslee, Woodside, Calif., assignor to Logisticon, Inc., Sunnyvale, Calif.

Filed Sep. 11, 1978, Ser. No. 941,028
Int. Cl.[2] F15B *15/22*
U.S. Cl. 60—459 **4 Claims**



1. An improved control system for a manually activated, fluid operated lift jack of the type having a fluid tank, a tank return line, a pump having an inlet connected to the tank and an outlet, and a manually activated control valve connected between the jack, the pump outlet and the tank return line to either supply fluid under pressure from the pump to the jack to cause it to extend, or to return fluid from the jack to the tank return line to cause the jack to retract, all at an operator's election, and wherein the improvement comprises

a proportional valve connected between the pump outlet, the tank, and the tank return line to provide selective proportional fluid communication between the truck's control valve and the tank return line whereby the speed at which the lift jack is retracted and extended is controlled by the setting of the proportional valve by bypassing a portion of the fluid under pressure from the pump outlet to the tank return line in extending the jack and restricting the flow of fluid from the truck's control valve to the tank return line in retracting the jack.

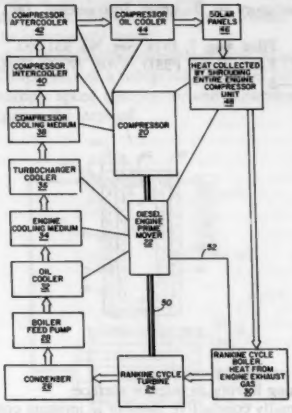
4,182,127

POWER RECOVERY AND FEEDBACK SYSTEM

Robert H. Johnson, One Crown Cir., Bronxville, New York, N.Y. 10708

Filed Dec. 12, 1977, Ser. No. 859,800
Int. Cl.[2] F01K *23/06*
U.S. Cl. 60—618 **10 Claims**

1. A method of recovering wasted energy from a combination of a gas compressor and a prime mover for said compressor, comprising passing a working fluid through at least one heat exchanger means operatively connected to said compressor and said prime mover to recover heat therefrom and thereby pre-heat said working fluid, passing said heated working fluid through boiler means, providing heat to said boiler means from said prime mover exhaust system to thereby vaporize said working fluid, passing said vaporized working fluid through turbine means, passing said vaporized working fluid to condenser means, passing the condensed working fluid to feed pump means, repeating the aforesaid steps, and utilizing the



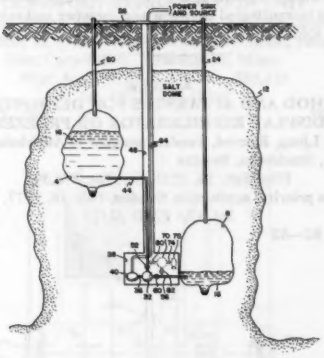
thus obtained shaft power of said turbine means to provide working energy.

4,182,128

UNDERGROUND PUMPED LIQUID ENERGY STORAGE SYSTEM AND METHOD

James H. Gardner, Salt Lake City, Utah, assignor to Oros Company, Salt Lake City, Utah

Filed Dec. 1, 1977, Ser. No. 856,248
Int. Cl.[2] F01K *23/00*
U.S. Cl. 60—652 **5 Claims**



1. An underground pumped energy storage system comprising

first and second cavities formed in an underground salt deposit, said first cavity being spaced from and at a higher level than said second cavity,

a hydrocarbon liquid disposed in one or both of said cavities,

electrical power generating means disposed at a level below said first cavity for generating electricity when liquid is applied thereto under pressure,

first conduit means for delivering liquid from said first cavity to said generating means to drive said generating means,

second conduit means for conveying liquid from said generating means to said second cavity, and

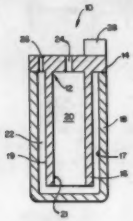
means for pumping liquid from said second cavity to said first cavity.

4,182,129

HEAT EXCHANGER

Otto Haunold, Carlsbad, and Malbone W. Greene, Vista, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 7, 1978, Ser. No. 931,332
Int. Cl.[2] F25B *21/02*; F25D *17/06, 17/00*; F28D *7/12*
U.S. Cl. 62—3 **9 Claims**



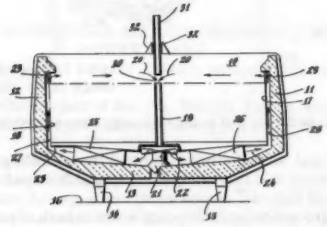
1. A heat exchanger comprising:
(a) a housing having an interior surface;
(b) a thermally conductive member in intimate contact with said housing;
(c) a thermally conductive element coaxially disposed in said housing and having an inner and an outer surface and in thermal communication with said member, wherein said inner surface of said element defines a first fluid passage, and wherein said interior surface of said housing and said outer surface of said element are in spaced relationship thereby defining a second fluid passage; said first and second fluid passages being in fluid communication;
(d) a first port for maintaining said first fluid passage in fluid communication with a first external fluid;
(e) a second port for maintaining said second fluid passage in fluid communication with a second external fluid; and
(f) means for regulating said member's temperature; wherein heat is transferred between said member and said element via solid conduction.

4,182,130

METHOD AND APPARATUS FOR DEFROSTING A DISPLAY REFRIGERATOR OR FREEZER

Hans G. Ljung, Bjärred, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 16, 1978, Ser. No. 878,301
Claims priority, application Sweden, Feb. 16, 1977, 7701713
Int. Cl.[2] F25D *21/12*
U.S. Cl. 62—82 **9 Claims**



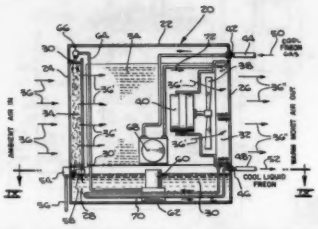
1. A method of defrosting cooling elements in an open-top display cooler or freezer chest having at least one fan that circulates air through a channel in said chest having cooling elements therein, and along the top of said chest, said channel having a substantially vertical air channel, said chest having articles stored therein comprising: circulating air in a channel along a side edge of said stored articles, providing a warm air guide channel for circulating air which upon defrosting assumes a position other than its normal position, said other position being such that an intake for said circulating air is blocked and warm atmospheric air is brought in from a place outside of the normal circulation path to said intake for being conveyed by said fan through said cooling elements in said channel and out to the atmosphere through said normal outlet opening, and upon defrosting said warm air guide channel assumes said other position when moved coaxially relative to the free end of said vertical air channel to thereby abut the latter in a position in alignment therewith.

4,182,131

HIGH EFFICIENCY AIR CONDITIONER

Ralph C. Marshall, 14739-1/2 Oxnard St., Van Nuys, Calif. 91411, and Ronald P. Consoli, 16853 Magnolia Blvd., Encino, Calif. 91436

Filed Nov. 27, 1978, Ser. No. 964,261
Int. Cl.[2] F25D *17/06*; F28D *5/00*
U.S. Cl. 62—91 **11 Claims**



1. In air conditioning apparatus wherein Freon is circulated between a condensing heat exchanger and an evaporating heat exchanger by a compressor and the condensing heat exchanger has ambient air passed therethrough to remove heat therefrom, the method of improving the efficiency of said apparatus comprising the steps of:
(a) sizing the condensing heat exchanger at approximately 75% of the rated tonnage of the evaporating heat exchanger;
(b) sizing the compressor at approximately 50%–62.5% of the rate tonnage of the evaporating heat exchanger; and,
(c) passing the ambient air used in cooling the condensing heat exchanger through an adiabatic cooling zone prior to passing it through the condensing heat exchanger so that the air entering the condensing heat exchanger is at the wet bulb temperature.

4,182,132

APPARATUS FOR THE COOLING AND DEHUMIDIFICATION OF AMBIENT AIR IN REGIONS HAVING A HOT AND HUMID CLIMATE

Gamal El Din Nasser, Puchheim, and Anton Pocrnja, Münich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

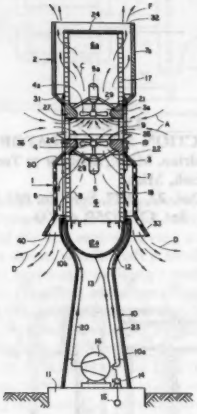
Filed Jan. 24, 1978, Ser. No. 871,987
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2703114
Int. Cl.[2] F25D *17/06*; F28C *1/00*; F25D *21/00*
U.S. Cl. 62—93 **10 Claims**

1. An apparatus for modifying the climate of a region having a hot moist climate which comprises:
refrigeration means operating in a refrigeration cycle and having an evaporator and a condenser for a refrigerant,
means defining at least two air guide passages including a first air-guide passage provided with said evaporator and a second air-guide passage provided with said condenser;
respective forced-draft means for inducing respective flows of ambient air through said passages in heat-exchanging

relationship with said evaporator and said condenser respectively; and

means for supporting said evaporator, said condenser, said air-guide passages and said forced-draft means above the ground and in an unenclosed free space, said evaporator and said condenser define respective axially-extending shafts in said first and second passages respectively, each of said shafts being closed at one end, each of said passages being formed with an air inlet at the opposite end, and a respective duct spacedly surrounding the the evaporator and condenser, said forced-draft means including a blower in each of said inlets whereby air is drawn generally radially through the evaporator and condenser by the respective blower.

8. A method of modifying the climate in a hot and humid region which comprises:



drawing a portion of ambient air in a first partial stream through a first air guide passage over an evaporator to cool the air traversing said first air passage;

drawing another portion of the same ambient air in a second partial stream through a second air guide passage provided with a condenser to abstract heat from said condenser;

circulating a refrigerant between said evaporator and said condenser to heat said condenser and cool said evaporator in a refrigeration cycle;

controlling the flows of air through said passages so that the throughflow of air through said second passage is greater than the throughflow of air through said first passage; and

discharging both said flows into the same open space while allowing a cooler flow from said first stream to settle while a warmer flow from said second stream is permitted to rise by the difference in the densities of the cooler and warmer flows.

4,182,133

HUMIDITY CONTROL FOR A REFRIGERATION SYSTEM

Rudy E. Haas; Michael E. Smorol, both of Syracuse, and Richmond S. Hayes, Fayetteville, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 2, 1978, Ser. No. 930,258

Int. Cl.[2] F25D *17/06;* **F25B** *13/00;* **F25D** *17/04;* **F25B** *1/00*

U.S. Cl. 62—93 **14 Claims**

1. A refrigeration system having a multiple speed compressor, a condenser and expansion means which comprises:

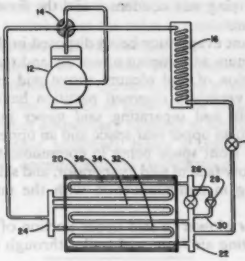
a multiple circuit evaporator;

distribution means connected to route refrigerant to the various circuits of the evaporator;

a valve means mounted in the distribution means to isolate at least one evaporator circuit from the remaining circuits such that refrigerant flow may be interrupted to at least one circuit of the evaporator; and

control means for regulating the valve means dependent upon the compressor speed.

11. A method of regulating refrigerant flow through a multiple circuit evaporator of a refrigeration system having a condenser, a multiple speed compressor and expansion apparatus which comprises the steps of:



routing the refrigerant through all of the circuits of the indoor heat exchanger when cooling is required;

sensing the humidity level of the enclosure to be conditioned;

limiting refrigerant flow to a preselected number of the circuits of the indoor heat exchanger when the humidity level is within a predetermined range such that additional latent heat cooling is provided when the compressor is operating at less than full speed.

4,182,134

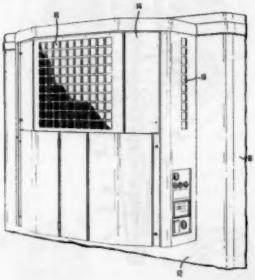
TRANSPORT REFRIGERATION UNIT

Herman H. Viegas, Richfield; Bruce D. Johnson, Rosemount, and Rodney H. Volk, Eden Prairie, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Aug. 15, 1978, Ser. No. 933,933

Int. Cl.[2] F25D *19/00*

U.S. Cl. 62—298 **10 Claims**



1. A transport refrigeration unit adapted to be mounted on the front wall of a trailer for conditioning the interior of the trailer, comprising:

an internal combustion engine and a refrigerant compressor driven thereby and connected together to form an engine-compressor unit, a refrigerant condenser, and a refrigerant evaporator;

a generally planar frame adapted to be mounted against the front wall of the trailer and seal around an opening in the front wall of the trailer;

wall means defining a generally vertically disposed plenum

encompassed by the upper part of said frame above an intermediate level cross member of said frame, said plenum being disposed relative to the plane of said frame with a material part of the front-to-rear depth of the plenum being forwardly of said plane;

upper support means extending forwardly from the upper part of said frame and the front wall of said plenum to provide the total support of said condenser;

lower support means extending forwardly from the lower part of said frame below said plenum supporting said engine-compressor unit totally from said frame in a position underlying said condenser and the forward depth of said plenum;

said refrigerant evaporator being disposed in the lower part of said plenum and sloping upwardly and rearwardly, the upper portion of said plenum above said evaporator including a vertically disposed partition having a blower inlet therein and separating said upper portion of the plenum into an upper rear space and an upper front space, said upper front space being in communication with the upper airflow face of said evaporator, and said upper, rear space being in communication with the interior of the trailer;

an evaporator blower in said upper portion of said plenum for circulating air from said trailer through said plenum; and

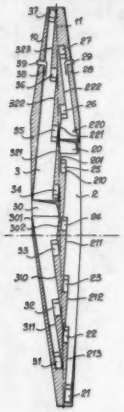
a removable front cover secured to said planar frame and encompassing those parts forwardly of said planar frame.

4,182,135

INSTALLATION FOR DISTRIBUTING REFRIGERATED AIR IN CONTAINERS

Daniel G. Calle, Montivilliers, France, assignor to Compagnie General d'Entretien et de Reparation - Coger, France

Filed Apr. 17, 1978, Ser. No. 897,762
Claims priority, application France, May 5, 1977, 77 13714
Int. Cl.[2] F25D *17/06*
U.S. Cl. 62—419 **7 Claims**



1. In an installation for distributing refrigerated air in stacked containers, particularly containers for food products, of the type comprising a vertical structure or shaft provided with a series of pairs of orifices, each pair of which possesses an orifice for the insufflation of refrigerated air into a container and an orifice for recovering the air from the same container, which shaft further comprises an air admission channel connected to the air insufflation orifices, an air return channel connected to the air recovery orifices, an air inlet passage in the admission channel, and an air outlet passage from the return channel, and which installation further comprises an air cooling battery and a fan forming a device for circulating refrigerated air between said air inlet and outlet passages in the shaft; the improvement wherein:

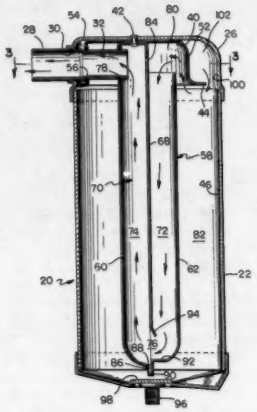
the admission channel presents, starting from the air inlet passage, a portion in spiked form whereby said channel successively supplies different air insufflation orifices, presenting a sharp reduction in section at each of these orifices, and, from the air outlet passage, the air return channel similarly presents a spiked portion whereby said channel is successively connected to different air recovery orifices, presenting a sharp reduction in section at the level of each of these orifices, said reductions in section being determined in order to have the same static pressure of insufflation at each level of the different insufflation orifices and the same static recovery pressure at each level of the different air recovery orifices.

4,182,136

SUCTION ACCUMULATOR

Robert L. Morse, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Dec. 22, 1977, Ser. No. 863,262
Int. Cl.[2] F25B *43/00*
U.S. Cl. 62—503 **24 Claims**

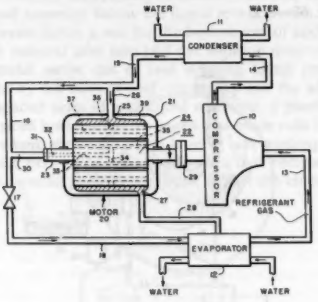


1. A suction accumulator for a compressor of a refrigeration system comprising: a storage vessel having an upper portion, a lower portion, an inlet in the upper portion of the vessel, an outlet, and side wall means, a conduit within the vessel extending downwardly into the lower portion of the vessel and being in fluid communication with the inlet and outlet, a bleed-through orifice in the conduit located in the lower portion of the vessel, a baffle means interposed between the inlet and outlet and having a peripheral portion disposed below the inlet, said peripheral portion generally following the side wall means and being spaced slightly therefrom around at least a portion of the baffle periphery, and deflector means in the vessel upper portion having surface means positioned with respect to said inlet to cause generally unidirectional circular swirling movement of refrigerant entering said inlet, said deflector means and baffle means cooperating to cause swirling movement of incoming refrigerant in the upper portion of said vessel and of refrigerant passing between said baffle means and said side wall means.

4,182,137
LIQUID COOLING SYSTEM FOR HERMETICALLY SEALED ELECTRIC MOTOR

Richard A. Erth, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 3, 1978, Ser. No. 866,428
Int. Cl.[2] F25B *31/00*
U.S. Cl. 62—505 10 Claims

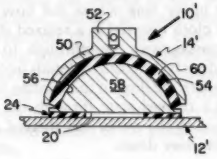


1. A cooling system having a compressor, a condenser, and an evaporator, all connected in a closed refrigeration circuit, a hermetically sealed electric motor, having a rotor affixed to a shaft and having a stator, which shaft is mechanically coupled to the compressor, said stator defining a cooling passage having a first portion extending radially inwardly and a second portion extending longitudinally, means for diverting a portion of the refrigerant from said condenser to said cooling passage, and means for collecting the diverted refrigerant and returning it to the evaporator, characterized in that the first portion of the cooling passage which extends radially inwardly exhibits a pressure drop higher than the pressure drop in the second portion which extends longitudinally.

4,182,138
ROTARY ENERGY STORAGE DEVICE

Dennis P. McGuire, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Mar. 4, 1977, Ser. No. 774,578
Int. Cl.[2] F16D *3/17*; F16F *15/04*; G05G *1/00*
U.S. Cl. 64—11 R 28 Claims



28. A rotary energy storage device comprising:

(a) a rotor rotatable about an axis passing through said rotor, the rotor being fabricated of a multiplicity of filamentary elements embedded in a resin matrix, the filamentary elements extending across the rotor and being oriented transverse to said axis of rotation, the rotor having an outer periphery of which at least a portion is disposed farther from the axis of rotation in a direction generally perpendicular to the axis than substantially any other portion of the rotor, the rotor being free of any substantial increase in thickness adjacent said at least a portion of the outer periphery, the thickness of the rotor being measured generally parallel to the axis of rotation;

(b) hub means for mounting on a rotatable shaft, the hub means having a mounting surface presented to and spaced from a generally parallel opposed surface of the rotor, the hub means also having a maximum dimension measured generally perpendicular to the axis of rotation which is less than a correspondingly measured maximum dimension of the rotor means; and

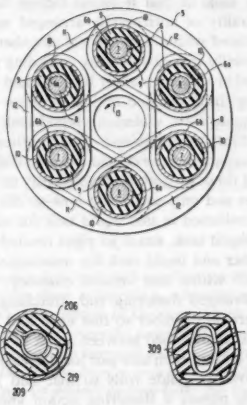
(c) interlayer means disposed between the rotor and the hub means, the interlayer means including a body of elastomeric material which has a first surface bonded to the mounting surface of the hub means and a second surface opposite the first surface and bonded to the opposed surface of the rotor so that the rotor is rotatable with the hub means about said axis of rotation,

the opposed surface of the rotor being disposed adjacent to at least one filamentary element having a length measured across the rotor at least as great as the length of substantially any other filamentary element in the rotor, the rotor within its outer periphery being a continuous member without any opening formed therethrough.

4,182,139
ELASTIC SHAFT COUPLING

Rudolf Hörnig, Esslingen; Bruno Beeskow, Bietigheim, and Günter Wörner, Stetten-Rommelshausen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 12, 1977, Ser. No. 796,385
Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622003
Int. Cl.[2] F16D *3/58*
U.S. Cl. 64—12 24 Claims



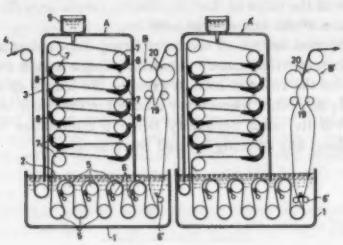
1. An elastic shaft coupling, comprising a disk-shaped elastic base body means, and an even number of connecting elements having substantially parallel axes and arranged in the base body means substantially about the center axis thereof, circumferentially successive ones of the connecting elements being coordinated to opposite connecting sides and being connected by way of at least one loop-like band means, characterized in that the band means rests on at least one of the connecting elements by way of an elastic intermediate member.

4,182,140

CLOTH CLEANING METHOD WITH STEAMING AND LIQUID FLOW AND AN APPARATUS THEREFOR

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Mar. 9, 1978, Ser. No. 884,847
Claims priority, application Japan, Mar. 16, 1977, 52-29024; May 31, 1977, 52-63524; Jul. 26, 1977, 52-99898[U]
Int. Cl.[2] D06B 3/12, 21/02
U.S. Cl. 68—5 E 1 Claim



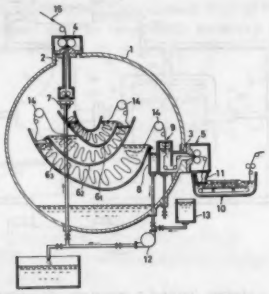
1. A cloth cleaning apparatus utilizing steam and a flowing liquid for cleaning a tubular knitted material, comprising a liquid tank having a liquid level therein, said tank having an open upper end and closed lower end and sides extending between the lower end and upper end, a vertical chamber located above said liquid chamber and having an open lower end and a closed upper end, the lower end of said vertical chamber extends downwardly through the open upper end of said liquid tank below the liquid level therein and above the lower end of said liquid tank so that the liquid in said tank forms a liquid seal for said vertical chamber, the sides of said liquid tank being spaced outwardly from said vertical chamber at the lower end thereof for forming a gap therebetween for passing the tubular knitted material being cleaned into and out of said liquid tank so that it passes below the liquid level therein, a plurality of horizontally arranged vertically space guide rolls located within said vertical chamber and arranged in two horizontally spaced vertically extending rows for guiding the material in a zigzag manner through said vertical chamber, a washing dish arranged in juxtaposition to and below each of said guide rolls, a cleaning liquid tank for supplying cleaning liquid into the upper end of said vertical chamber for flow into the uppermost one of said washing dishes so that the cleaning liquid flows by gravity downwardly to the lower said washing dishes and into said liquid tank so that the cleaning liquid can be collected in said liquid tank for recirculation to said cleaning liquid tank, steam jet pipes located in one of said vertical chamber and liquid tank for maintaining wet heat at least at 105° C. within said vertical chamber, a plurality of horizontally arranged fluttering and stretching rolls located within said vertical chamber so that each said fluttering and stretching rolls is positioned between a pair of said guide rolls with the guide rolls of each said pair located each in a different one of said rows of guide rolls so that said fluttering and stretching rolls impart a fluttering action and a stretching action to the tubular knitted material passing over said guide rolls, an air jet pipe located in the path of the tubular knitted material passing out of said liquid tank for supplying air into the tubular knitted material for swelling the material into its tubular shape, pressing rolls in the path of the swollen tubular knit material for pressing the tubular knitted material and stretching it in the direction transverse to its longitudinal direction, and rolls for retaining the stretched width of the tubular shaped material which has been stretched by the pressing rolls and for guiding the advance of the tubular knitted material.

4,182,141

APPARATUS FOR CARRYING OUT CONTINUOUS CLOTH MATERIAL TREATING PROCESS

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed May 17, 1978, Ser. No. 906,853
Claims priority, application Japan, Jun. 1, 1977, 52-64163; Sep. 14, 1977, 52-110785
Int. Cl.[2] D06B 3/10
U.S. Cl. 68—5 E 3 Claims



1. Apparatus for carrying out a continuous cloth material treating process comprising a high pressure steamer drum having a cloth inlet and a cloth outlet, an entrance seal mechanism at said cloth inlet of said drum and an exit seal mechanism at said cloth outlet of said drum, a plurality of generally horizontally arranged liquid flow tanks including at least an upper tank and a lower tank, said lower tank positioned beneath said upper tank, each of said upper and lower tanks having an inlet end and an outlet end with an elongated flow passageway therebetween, the inlet end of each of said upper and lower tanks being located vertically above the outlet end thereof so that the treating liquid introduced into the inlet end flows to and overflows from the outlet end, the outlet end of said upper tank being positioned above the inlet end of said lower tank so that the treating liquid overflowing said upper tank flows into said lower tank, means for supplying a flow of treating liquid into the inlet end of said upper tank so that it continuously flows therethrough and then into said lower tank for flow therethrough from the inlet end to the outlet end thereof, means for guiding cloth material from said cloth inlet into the inlet end of said upper tank where the flow of the treating liquid carries the cloth material in a relaxed state through the elongated flow passageway therethrough to the outlet end thereof and then directs the cloth materials into the inlet end of said lower tank where the flow of the treating liquid carries the cloth material in a relaxed state through the elongated flow passageway therein to the outlet end thereof and then to the outlet from said steamer drum.

4,182,142

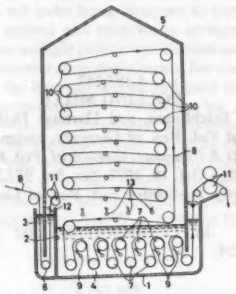
CONTINUOUS CLOTH DYEING-AND-WASHING APPARATUS

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Jun. 30, 1978, Ser. No. 920,647
Claims priority, application Japan, Jul. 7, 1977, 52/81281
Int. Cl.[2] D06B 3/12, 21/02, 23/18
U.S. Cl. 68—5 E 1 Claim

1. A continuous cloth dyeing-and-washing apparatus comprising first walls forming a liquid reservoir closed at its sides and bottom and open at its top, an upwardly extending partition wall located within said reservoir dividing it into a dyeing

solution reservoir and a washing liquid reservoir disposed in side-by-side relation, said dye solution reservoir and washing liquid reservoir each having a liquid level therein, second walls forming a vertically extending cover tank closed at its upper end and sides and open at its bottom, the bottom of said cover tank having a horizontal cross sectional area and shape such that it fits downwardly into said liquid reservoir with the sides of said cover tank spaced inwardly from the sides of said liquid reservoir so that the bottom ends of the sides of said cover tank extend downwardly into said dye solution reservoir and said washing liquid reservoir below the liquid levels therein so that the liquid therein forms a seal for the bottom end of said cover tank, a cloth material inlet into said dye solution reservoir and a cloth material outlet out of said washing liquid reservoir being formed by the sides of said cover tank and the adjacent outwardly spaced sides of said liquid reservoir, a plurality of vertically spaced horizontally arranged first guide rolls located in said cover tank above the liquid level in said washing liquid reservoir, said first guide rolls disposed in two vertically extending rows spaced horizontally apart so that the cloth material travelling back and forth over said first guide rolls from one vertical row to the other moves along a zigzag path, a plurality of horizontally arranged second guide rolls located in said washing liquid reservoir below the liquid level therein and arranged in two horizontal rows comprising an upper row and a lower row so that the cloth material in said washing liquid reservoir can pass over said second guide rolls moving back and forth from the upper horizontal row to the lower horizontal row so that the cloth material moves in a generally vertically arranged zigzag path through said washing liquid reservoir, means located in said cover tank for supplying steam thereto for maintaining the interior of said cover tank under humid heat conditions, and air jet pipes located within said washing liquid reservoir between said upper horizontal row and lower horizontal row with said jet pipes arranged to direct air toward the cloth material as it moves upwardly around said second guide rolls in said upper horizontal row so that air and washing liquid penetrate between the fibers of the cloth material due to the pressed contact of the cloth material against said second guide rolls.



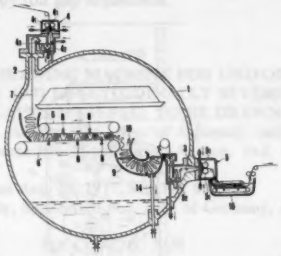
4,182,143

HIGH PRESSURE STEAMER INCORPORATING MONOMER RECOVERING MECHANISM

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Dec. 12, 1978, Ser. No. 968,780
Claims priority, application Japan, Dec. 20, 1977, 52-153151
Int. Cl.[2] D06B *3/10, 21/02*
U.S. Cl. 68—5 E **1 Claim**

1. A high pressure steamer for high hygro-thermic treatment of a cloth material comprising a drum body which is capable of maintaining a high humid heat of 110° to 160° C. therein and which is arranged with means to continuously introduce said cloth material thereinto and guide it out therefrom, a cloth material transporting mechanism within said high pressure steamer which conveys the cloth material in a no tension and relaxed state through the high humid heat atmosphere within said high pressure steamer and a slow cooling tank within said high pressure downstream of the transporting mechanism which gradually cools the conveyed cloth material down to a temperature of about 50° C., said high pressure steamer further including therein a monomer recovery mechanism located between the end part of the transporting mechanism and the slow cooling tank, the monomer recovering mechanism comprising a washing tank for washing off a monomer sticking to the cloth material, the washing tank being equipped with a waste liquid discharging pipe to guide to the outside of said drum body a washing treatment liquid which contains said monomer washed from said cloth material.

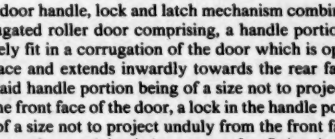


4,182,144

DOOR HANDLE LOCK AND LATCH MECHANISM FOR CORRUGATED ROLLER DOORS

Simon Leivenzon, and Steven Leivenzon, both of Caulfield, Australia, assignors to Firmaframe Nominees Proprietary Ltd., Victoria, Australia

Filed May 18, 1978, Ser. No. 907,416
Int. Cl.[2] E05B *5/00, 9/08, 65/00;* **E06B** *9/20*
U.S. Cl. 70—100 **9 Claims**



1. A door handle, lock and latch mechanism combination for a corrugated roller door comprising, a handle portion shaped to closely fit in a corrugation of the door which is open at the front face and extends inwardly towards the rear face of the door, said handle portion being of a size not to project unduly from the front face of the door, a lock in the handle portion and being of a size not to project unduly from the front face of the handle portion, and latch bar means for fitting in the rearwardly open corrugation adjacent said corrugation in the front face of the door in which the handle portion is fittable and to connect with said lock through opening means in either the top or bottom walls of said corrugation in which the handle portion is fittable, the latch bar means being movable by operation of the lock to a position inwardly of the sides of the door to allow the door to be openable and to a position where it extends outwardly of the side of the door to engage with latch engaging means associated with the door frame of the door whereby to lock the door with respect to the door frame.

4,182,145
KEY-OPERATED LOCKS

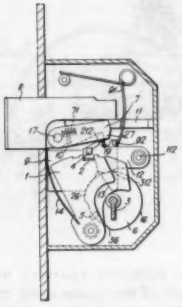
Arthur D. Tippin, Tamworth, and Malcolm J. White, Whittington, both of England, assignors to Chubb & Son's Lock & Safe Co. Ltd., London, England

Filed Jan. 24, 1978, Ser. No. 871,984

Claims priority, application United Kingdom, Jan. 24, 1977, 2779/77

Int. Cl.² E05B *65/06*

U.S. Cl. 70—134 **12 Claims**



1. In a key-operated security lock comprising a key-identification mechanism, a thrower turned by a key and a deadbolt having a retracted position and an extended position, the improvement wherein said deadbolt is isolated from said thrower, and including a stop preventing retraction of said deadbolt from said extended position and operating means responsive only to identification of a correct key for coupling said thrower to said deadbolt and for removing said stop, said operating means including a movable member operatively associated with one of said deadbolt and thrower, coupling means interposed between said movable member and the other of said deadbolt and thrower for coupling said thrower to said deadbolt as a result of movement of said movable member, and means responsive to identification of a correct key by said key identification mechanism for allowing said movable member to move to couple said deadbolt and thrower together and for preventing such movement in the event an incorrect key is used to isolate said deadbolt from said thrower.

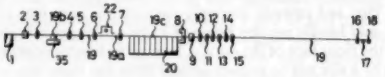
4,182,146
HOT ROLLING MILL

Hans Wladika, and Theodor Sevenich, both of Dortmund, Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Division of Ser. No. 756,708, Jan. 4, 1977, abandoned. This application Jul. 17, 1978, Ser. No. 925,053

Int. Cl.² B21B *45/00, 1/26, 9/00*

U.S. Cl. 72—202 **16 Claims**



1. A hot rolling mill for rolling a continuous wide band of metal along a substantially linear working path, said mill comprising a plurality of sequentially arranged processing units including a pusher furnace means, a multiple stand roughing section following said pusher furnace means and including a scale washer, a multiple stand finishing section following the roughing section, a reeling up section following the finishing section, shear means at an inlet end of said finishing section, roller beds interposed between said sections for conveying the band therebetween and band withdrawing means preceding said shear means for withdrawing a roughed band of material from the finishing section, a first furnace device positioned upstream of a final roughing stand of said roughing section, and provided with reeler means for reeling up a roughed band of material about a horizontal axis and maintaining the working temperature of said roughed band of material supplied thereto in a reverse rolling direction along said working path from said final roughing stand, and a second furnace device disposed laterally of the working path of said mill and following at least a first stand of the roughing section and adapted to receive a roughed slab of material and to maintain the roughed slab rolled in said roughing section at working temperature, and means for moving said roughed slab laterally between said working path of the mill and said second furnace device.

4,182,147
ROLLING MILLS

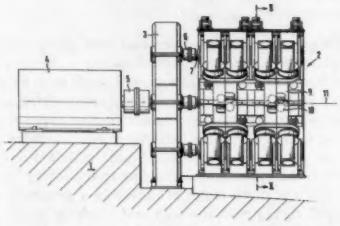
Hans Brauer, Leichlingen, and Hartmut Diel, Monchengladbach, both of Fed. Rep. of Germany, assignors to Friedrich Kocks GmbH & Company, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 18, 1978, Ser. No. 952,328

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1977, 2747518

Int. Cl.² B21B *1/18, 31/02*

U.S. Cl. 72—224 **19 Claims**



1. A rolled block for rolling a bar-shaped article, comprising a plurality of successive sizing passes, each pass formed by at least three rollers forming a rolling unit, said rollers being angularly offset from sizing pass to sizing pass around the rolling axis of the article, a support frame extending the full length of said rolling block, a plurality of pivotable elements at each pass corresponding in number to said at least three rollers, said pivotable elements being journalled for rotation at one end on said support frame, one of said at least three rollers being journalled in cantilever manner on the opposite end of each pivotable element, said pivotable elements being pivotable in cross sectional planes of the sizing passes extending transversely of the rolling axis of the article so that the rollers can be rotated in these cross sectional planes toward and away from the rolling axis of the article, a plurality of synchronously driven drive shafts equal in number to the number of rollers of each sizing pass, said drive shafts being parallel to and radially spaced around the rolling axis of the article, the axes of said shafts being at the pivot axis of said one end of each of said pivotable elements, gear means drivingly connecting said drive shafts and said rollers through said pivotable elements, drive means adjacent said rolling block and transmission means connecting said drive means and said drive shafts.

4,182,148

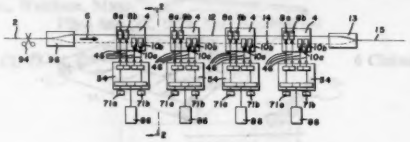
MULTI-LINE ROLLING SYSTEM

Martin Gilvar, Oakham, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Continuation-in-part of Ser. No. 812,453, Jul. 5, 1977, abandoned. This application Apr. 3, 1978, Ser. No. 892,932

Int. Cl.[2] B21B *1/00, 35/00*

U.S. Cl. 72—228 **12 Claims**



1. A multi-line rolling system for rolling product received from a feed line, comprising: a plurality of rolling positions aligned in the direction of rolling; roll housing means for supporting first and second pairs of work rolls at each rolling position, the first roll pairs being arranged to form a first rolling line and the second roll pairs being arranged to form a second rolling line; a single power source associated with each rolling position, intermediate drive means for connecting said power source to the first and second roll pairs at each rolling position, said intermediate drive means having clutch means associated therewith for selectively interrupting the drive connection between said power source and the roll pairs forming either rolling line, whereby one of said rolling lines may be rendered inoperative while the other rolling line continues to roll product received from said feed line; and, switching means for alternately directing product from said feed line to either of said rolling lines.

4,182,149

ROLL STAND

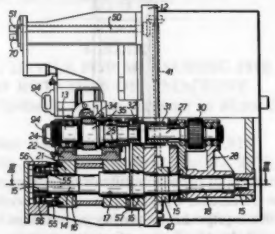
Alexander I. Wilson, Sheffield, England, assignor to Hille Engineering Company, Ltd., Sheffield, England

Continuation of Ser. No. 741,668, Nov. 15, 1976, abandoned. This application Nov. 28, 1977, Ser. No. 855,193

Claims priority, application United Kingdom, Nov. 14, 1975, 47037/75

Int. Cl.[2] B21B *29/00, 31/26, 35/12*

U.S. Cl. 72—241 **19 Claims**



1. A rolling mill stand comprising:

(a) a first roll shaft;

(b) a second roll shaft substantially parallel to said first roll shaft;

(c) first and second drive shafts for said first and second roll shafts respectively;

(d) first carrier means for supporting said first roll shaft and said first drive shaft;

(e) a first coupling between said first roll shaft and said first drive shaft;

(f) second carrier means for supporting said second roll shaft and said second drive shaft;

(g) a second coupling between said second roll shaft and said second drive shaft, and

(h) roll gap adjustment means effective on at least one of said first and second carrier means for adjusting the separation of said first and second roll shafts;

(i) said roll gap adjustment means adjusting equally said roll shaft and said drive shaft of said at least one carrier means, whereby the disposition of said roll shaft relative to said drive shaft is unaltered and said couplings are substantially unaffected by roll gap adjustment.

4,182,150

CARRIAGE DRAWING MACHINE FOR UNIFORMLY DRAWING AND LONGITUDINALLY SEVERING ELONGATED MATERIAL TO BE DRAWN

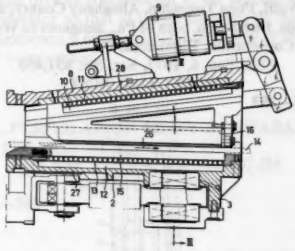
Johann Greven, Aachen, Fed. Rep. of Germany, assignor to Schumag Schumacher Metallwerke, Aachen, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,901

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638628

Int. Cl.[2] B21C *1/28*

U.S. Cl. 72—290 **2 Claims**



1. In a carriage drawing machine for uniformly drawing elongated material to be drawn, having two drawing carriages on a carriage bed, a drive shaft disposed parallel to the carriage bed and having two cams revolvable therewith for effecting reciprocating motion of the carriages in mutually opposite directions, a drawing jaw vise on each carriage for alternatingly gripping the material to be drawn, each of the vises having two drawing jaws held in a housing by a wedge structure with bearing rollers interposed which serves to self-lock during the drawing, the improvement wherein the two drawing jaws of each vise are disposed on top of one another and, within clamping travel distance, the lower one of said drawing jaws is movable parallel to the direction of drawing and the upper one of said drawing jaws is movable parallel to the wedge structure of the housing, said upper drawing jaw having a flat lower surface and being rotatable about an axis parallel to the drawing direction for accommodating to flat and trapezoidal profiles of the material to be drawn.

4,182,151

CLEARING OF RETAINED LIQUIDS FROM RECESSES IN THIN WALLED MEMBERS

Peter C. Pedersen, R.D. 2, Woods Rd., Lebanon, N.J. 08833

Filed Oct. 6, 1977, Ser. No. 839,893

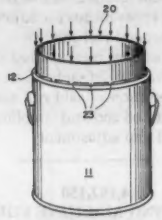
Int. Cl.[2] B21D *28/30*

U.S. Cl. 72—325 **11 Claims**

1. A tool for preventing flowable material from becombing entrapped in the recessed circular rim of a container which comprises

a circular band having the diameter of the recessed rim, and a plurality of triangular profile teeth on one edge of said

band for forming apertures in said recessed rim successive ones of said teeth being of successively varying heights to



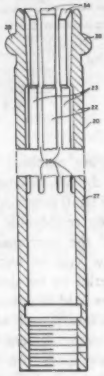
facilitate the formation of said apertures in said recessed rim.

4,182,152

GRID SLEEVE BULGE TOOL

Ronald E. Vaill, Penn Township, Allegheny County, and William D. Phillips, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sep. 8, 1977, Ser. No. 831,459
Int. Cl.² B21D *39/04*
U.S. Cl. 72—393 **5 Claims**



1. A bulge tool comprising:

a hollow housing;

multiple spaced tines on one end of said housing extending axially outward from the housing base, said spaced tines including alternately spaced bulge tines and support tines;

a projection on each of said bulge tines which extends radially outward from the bulge tines outer surface;

a movable ram in said housing, said ram having surfaces thereon complementary to the inner surfaces on said bulge and support tines; and

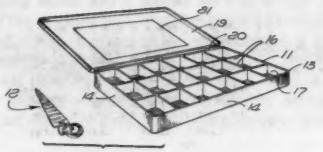
means on said ram adapted to be engaged by a ram puller so that when the ram is pulled into said housing and into engagement with the tine surfaces, the bulge tines are caused to move radially outward and create bulges in the tube while the support tines maintain their initial position and bear against the ram surfaces on one side and against the tube inner surface on their other side to thereby prevent shrinking of the tube in the areas of the projections during the time the bulges are being formed in the tube.

4,182,153

WATCH SPRING BAR KIT

Wayne G. Dawson, 757 3rd St., McFarland, Calif. 93250

Division of Ser. No. 760,965, Jan. 20, 1977, Pat. No. 4,090,606.
This application Jan. 9, 1978, Ser. No. 868,066
Int. Cl.² B21D *7/00*
U.S. Cl. 72—414 **4 Claims**



1. The method of bending a watch spring bar that comprises:

positioning said spring bar between two superimposed concavely curved elements, each of which has a different radius of curvature; and

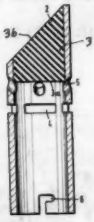
pressing said elements toward one another and against the spring bar therebetween with a force bending the spring bar to a curvature corresponding essentially to that of said elements.

4,182,154

INITIALIZING ULTRASONIC TEST EQUIPMENT WITH A PARTICULAR REFERENCE ELEMENT

Dieter Lather, Rheurdt; Wolfgang Terschüren, Mülheim; Kurt Hannoschöck, Sonsbeck; Günter Simoneit, and Karl Ries, both of Mülheim, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 822,919, Aug. 8, 1977, abandoned. This application Feb. 16, 1978, Ser. No. 878,240
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635982
Int. Cl.² G01N *29/00*
U.S. Cl. 73—1 DV **6 Claims**



1. In a method of preparing ultrasonic test equipment having at least one transducer operating in conjunction with a coupler fluid, the test equipment requiring adjustment on the basis of reference signals, placing a reference element onto and over the transducer, the element being comprised of a cylindrical sleeve or tube having an axis, one oblique end and a partially hollow interior adjacent the opposite end of the sleeve at which said transducer is inserted, further having openings for ingress of water when placed in the coupler fluid and upon insertion of the transducer into the hollow interior of the sleeve the reference element being further comprised of:

a reflector body in the sleeve and disposed adjacent said oblique end and having a correspondingly oblique surface, the reflector body having another interior surface facing the hollow interior of the sleeve and being spaced from the said opposite end of the sleeve at a particular distance; the reference element having additionally venting open-

ings adjacent to the other surface which would open to the hollow interior of the sleeve; and

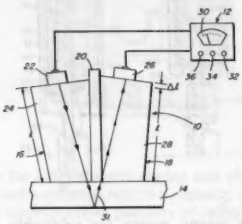
using the reference element for the generation of said reference signals in and by means of said transducer.

4,182,155

METHOD AND APPARATUS FOR ZERO POINT CALIBRATION OF ULTRASONIC THICKNESS GAUGE

Kenneth A. Fowler, Medfield, Mass., assignor to Panametrics, Inc., Waltham, Mass.

Filed Sep. 22, 1978, Ser. No. 944,741
Int. Cl.² G01N *29/00*
U.S. Cl. 73—1 DV **6 Claims**



1. A transducer comprising

a first block of delay material,

a second block of delay material,

an acoustic barrier separating said blocks,

a first transducer means mounted on said first block, capable of transmitting ultrasonic waves, and

a second transducer means mounted on said second block, capable of receiving ultrasonic waves during pitch-and-catch operation of said transducer, said second transducer means further being capable of operation in the pulse-echo mode,

in which said second block has a configuration such that an ultrasonic wave passing through said second block during operation of said transducer has a longer path than the path of said wave through said first block,

the difference between the lengths of wave paths in said blocks being selected so that the difference in time of wave travel through said blocks due to said difference in paths is at least as great as the geometric time delay in transmission of an ultrasonic wave through said transducer in the pitch-and-catch mode.

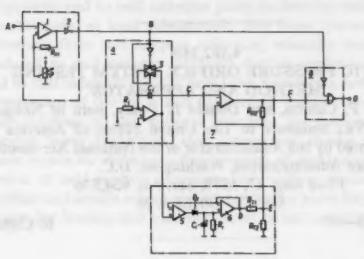
4,182,156

MEASURING DEVICE FOR MEASURING THE ANGLE OF ROTATION OF A MACHINE

Heimo Denk, Feldbach, Austria, assignor to Hans List, Graz, Austria

Filed Apr. 12, 1978, Ser. No. 895,811
Claims priority, application Austria, Apr. 13, 1977, 2561/77
Int. Cl.² G01M *15/00*
U.S. Cl. 73—35 **5 Claims**

1. A device for producing a gate signal with a duration equal to the duration of the rotation of a shaft of a machine between a reference angular position of said shaft and its angular position at the instant of an occurrence of a phenomenon caused by the operation of said machine, said gate signal being usable in combination with further signals to measure the angle of rotation of said shaft between said reference angular position of said shaft and its angular position at the instant of the machine-typical phenomenon, said device comprising transducers which transmit a number of pulses when said shaft passes the reference angular position and the machine-typical phenomenon occurs, said pulses being transmittable to a processing circuit which generates an angle proportional signal out of the time interval between the passing of said shaft at the reference angular position and the occurrence of the machine-typical phenomenon whereby said transducer signals are transmittable to a threshold value switch, wherein the outlet of said threshold value switch is connected to a control device of a constant-voltage integrator and said control device resets and blocks or releases said integrator according to the switching condition of the threshold value switch, and wherein the outlet of said



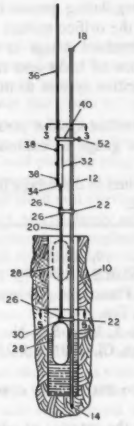
integrator is connected to a first inlet of a second comparator and a peak value storage, the outlet of said peak value storage being connected to a voltage divider whereby the midpoint tap of said voltage divider is connected to the second inlet of said second comparator so that at the occurrence of the machine-typical phenomenon a usable signal is available at the outlet of said second comparator.

4,182,157

SOIL PERCOLATION TESTING APPARATUS

Richard E. Fink, R.D. #2, Etters, Pa. 17319

Filed Mar. 17, 1978, Ser. No. 887,488
Int. Cl.² G01F *23/08*
U.S. Cl. 73—38 **5 Claims**



1. Soil percolation testing apparatus comprising in combination, an elongated guide rod pointed at one end and adapted to be installed in a soil testing hole with the pointed end driven into the bottom of said hole for sole support thereby in said hole, a gauge rod of less length than said guide rod, at least one guide bracket secured to said gauge rod and provided with a bearing hole in which said guide rod extends for free sliding movement of said bracket longitudinally along said guide rod, a float secured to the lower end of said gauge rod below said guide bracket, an elongated scale strip secured to the upper end of said gauge rod, a reference bracket having an opening in one end to receive the upper portion of said guide rod for support

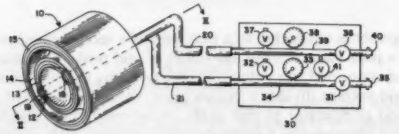
by said rod, and also having a slot in the opposite end portion to accommodate said scale strip for free relative slide, locking means operable to secure said reference bracket adjustably on said guide rod, and a reference member on said reference bracket adjacent said slot therein and operable relative to said scale strip to indicate measuring indicia on said strip incident to testing the percolation rate of the soil in which said test hole is formed.

4,182,158

STATIC PRESSURE ORIFICE SYSTEM TESTING METHOD AND APPARATUS

Randolph F. Culotta, and Donald L. Posey, both of Newport News, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 17, 1978, Ser. No. 934,576
Int. Cl.[2] G01M *3/26*
U.S. Cl. 73—40 **10 Claims**



1. A method of verifying the integrity of a static pressure orifice system of an orifice in a planar surface, a connecting tube, and pressure receiving gauge comprising the steps of:
   (a) providing an orifice system testing device;
   (b) employing a vacuum to secure the testing device against the planar surface and over the orifice of the orifice system to be tested to thereby isolate the orifice system from the outside environment;
   (c) applying and regulating pressurized gas through the testing device to the orifice system to be tested;
   (d) monitoring a standard gauge in the testing device to detect the presence of leaks and thereby determine the capacity of the orifice system to maintain constant pressure;
   (e) comparing the orifice system pressure receiving guage with the standard guage to calibrate the orifice system guage; and
   (f) releasing the vacuum to disengage the testing device from the orifice system.

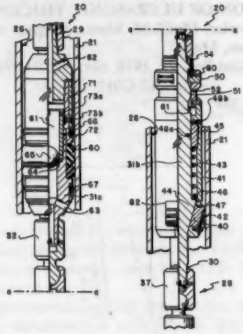
4,182,159

PRESSURE TESTING TOOL

Ronald K. Churchman, Plano, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 1, 1978, Ser. No. 930,021
Int. Cl.[2] G01M *3/28*
U.S. Cl. 73—40.5 R **17 Claims**

1. A tool for pressure testing flow conductors, comprising:
   a. mandrel means;
   b. means, carried on the exterior of said mandrel means, for sealing between said mandrel means and said flow conductor;
   c. a flow passage through said mandrel means having openings on either side of said sealing means;
   d. a check valve contained within said flow passage blocking fluid flow in one direction and allowing fluid flow in the other direction;
   e. means for expanding said sealing means;
   f. slips carried by said mandrel means in an initially retracted position;
   g. means for biasing said slips to an expanded position to engage said flow conductor whereby movement of said tool in said one direction is prevented and movement of said tool in said other direction is allowed;
   h. means for holding said slip biasing means in an inert condition until activated; and
   i. said means for expanding said sealing means further comprising telescoping sections on said mandrel adjacent to



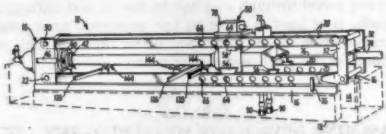
said sealing means, means for releasably holding said telescoping sections in an extended position, and means for applying a force to one of said telescoping sections when said slips are engaged with said flow conductor, whereby said releasable holding means are overcome and said telescoping sections move to a position expanding said sealing means to engage said flow conductor.

4,182,160

HYDROSTATIC PIPE TESTER

Joseph E. Powers, and Ranoldo H. Grimoldi, both of Napa, Calif., assignors to Kaiser Steel Corporation, Oakland, Calif.

Filed Jul. 31, 1978, Ser. No. 929,429
Int. Cl.[2] G01M *19/00*
U.S. Cl. 73—49.5 **10 Claims**



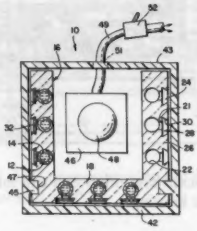
1. A tester for hydraulically testing the internal fluid pressure bearing capacity of a pipe, said tester comprising, in combination: a foundation defining an open topped elongate sump; a tension frame supported on said foundation and extending longitudinally of said sump; a head bolster secured to said frame at one end thereof for select sealing engagement with one end of the pipe, said bolster having a high fluid pressure source connected thereto for admitting high pressure fluid into the pipe; a movable bolster carried by the other end of the frame for sealing engagement with the other end of the pipe, said movable bolster being selectively movable longitudinally of the frame to accommodate pipes of different lengths; a pump carried by said movable bolster and having outlet means opening through the bolster, which pump and bolster thereby may be free of flexible and extensible conduits therebetween, so as to charge high volume fluid under pressure into the interior of a pipe engaged by the bolster and inlet means depending therefrom into the sump to withdraw fluid from the sump; and means to selectively close the charge pump against fluid flow when high pressure fluid is admitted into a pipe being tested.

4,182,161

APPARATUS FOR TIMING AND RECORDING SEDIMENTATION RATE OF FLUID SAMPLES

Walter Greenfield, 24 Eastern Dr., Ardsley, N.Y. 10502

Filed Dec. 19, 1978, Ser. No. 970,918
Int. Cl.[2] G01N *15/04*
U.S. Cl. 73—61.4 6 Claims



1. A device for automatically timing and photographically recording the sedimentation rate of a plurality of fluid samples contained in a corresponding plurality of cylindrical, transparent test tubes, comprising:

a lamp,

a plurality of photographic paper means,

a rack having a vertical wall means surrounding said lamp, said wall means having;

a plurality of vertical, cylindrical bores for receiving said tubes, each of said bores being substantially, equally spaced from said lamp;

each of said vertical bores having a vertical slit adjacent to and opening into said bores respectively, the length of each of said vertical slits being substantially equal to the length of one of said test tubes;

vertical channels adjacent to and opening into said slits for receiving said photographic paper means; and

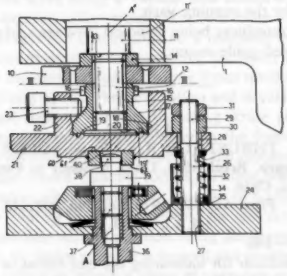
a rectangular box-like housing removably disposed over said rack to exclude ambient light therefrom.

4,182,162

DUROMETER

Alfred Ernst, Via San Martina 6, Vezia Ticino, Switzerland

Filed Mar. 27, 1978, Ser. No. 890,189
Claims priority, application Switzerland, Mar. 25, 1977, 3827/77
Int. Cl.[2] G01N *3/44*
U.S. Cl. 73—81 9 Claims



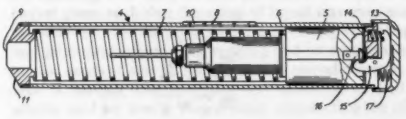
1. A durometer, comprising in combination, an indentor point for penetrating under pressure of an applied load a surface being tested for hardness, said indentor point having an axis; load generating means for generating a load; a support structure connected to said load generating means; applying means having an axis and connected to said load generating means and passing through said support structure for transmitting the load to said indentor point in the axial direction thereof, said support structure including a flange extending normal to the axis of said applying means and being rigidly connected to said applying means; an articulation joint connected at one end to a portion of said support structure and at an opposite end to said indentor point to thereby maintain the indentor point at least substantially free from transmission of movement from said support structure, whereby moment engendered in said support structure during application of the load to said indentor point is kept from interfering with further transmission of the load; and suspending means connected to other portions of said support structure for suspending said indentor point therefrom, said suspending means including detent means for defining a first position of said indentor point relative to said support structure and resilient biasing means between said detent means and said indentor point for applying a force for biasing said indentor point in said position.

4,182,163

METHOD AND APPARATUS FOR MEASURING THE STRENGTH OF A FIBROUS BODY

Preben Hoffmeyer, Hilleroed, Denmark, assignor to Wood-Slimp GmbH, Chur, Switzerland

Continuation of Ser. No. 718,358, Aug. 27, 1976, abandoned.
This application Apr. 21, 1978, Ser. No. 898,695
Claims priority, application Denmark, Sep. 3, 1975, 3943/75
Int. Cl.[2] G01N *3/48*
U.S. Cl. 73—82 11 Claims



1. Apparatus for measuring the strength of a material comprising: an elongated casing having front and rear end portions, an inertia body positioned in said casing for movement between said front and rear end portions, an elongated piercing plug attached to said inertia body toward said front end portion of said casing, an opening in said front end portion of said casing for extension of said piercing plug therethrough, spring means for driving said inertia body in a direction from said rear end portion toward said front end portion of said casing, latch means for latching said inertia body adjacent said rear end portion with said piercing plug completely within said casing in longitudinally spaced relationship to said front end portion, trigger means for releasing said latch means to free said insertia body for movement toward said front end portion under the force of said spring means to extend said piercing plug through said opening and drive same into a material against which said front end portion is positionable, and said trigger means being operative to release said latch means under influence of manual force applied thereto in a direction for urging said front end portion of said casing into engagement with a material whose strength is being tested.

4,182,164

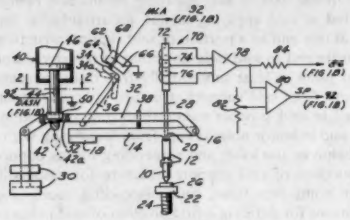
PENETRATION HARDNESS TESTER WITH DIGITAL READOUT

Donald R. Fohey, Plymouth, Mich., assignor to K. J. Law Engineers, Inc., Farmington Hills, Mich.

Filed Sep. 18, 1978, Ser. No. 943,315
Int. Cl.[2] G01N *3/48*
U.S. Cl. 73—83 28 Claims

1. In a penetration hardness tester which includes a penetrator, lever means carrying a load adapted to be applied to said penetrator, linkage means operatively coupled to said lever means and means connected to said linkage means for gradu-

ally lowering said lever means onto said penetrator, the improvement comprising switch means coupled to said lever means and said linkage means for directly indicating application of the entire load carried by said lever means to said penetrator.

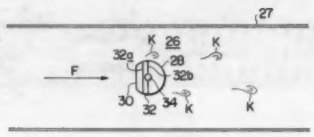


4,182,165

FLUID FLOW RATE MEASURING APPARATUS

Toru Kita, Yokohama, Japan, assignor to Nissan Motor Co., Limited, Japan

Filed Jun. 6, 1978, Ser. No. 913,069
Claims priority, application Japan, Jun. 13, 1977, 52/68879
Int. Cl.[2] G01F *1/32*
U.S. Cl. 73—194 VS **13 Claims**



1. A detector section of a fluid flow rate measuring apparatus which measures a flow rate of a fluid flowing in a conduit, comprising:

a semi-cylindrical body disposed in said conduit, said semi-cylindrical body being formed with a flat section the surface of which faces upstream and which is substantially perpendicular to the direction of flow of said fluid; and

means for sensing the number of vortexes created by said semi-cylindrical body during: flowing of said fluid in said conduit, said means for sensing including a slit through said semi-cylindrical body, extending parallel to the flat surface of said semi-cylindrical body, and vortex transducer means disposed in said through slit for converting hydrodynamical variations applied thereto into electrical parameter variations.

4,182,166

DYNAMOMETER TEST STAND

Charles H. Herr, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 18, 1977, Ser. No. 816,702
Int. Cl.[2] G01L *3/16*
U.S. Cl. 73—134 **13 Claims**

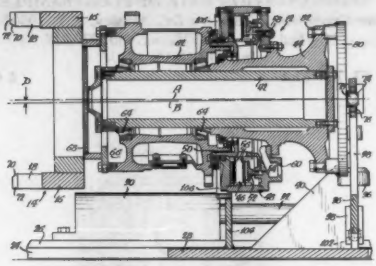
1. A test stand comprising:

a dynamometer including a housing having opposed ends;

one of said ends including a rotary input adapted to be coupled to a rotary output of a mechanism to be tested and driven about an axis;

a base for mounting said housing;

a single self-aligning bearing located on said axis and interconnecting said housing at the other end of the housing and said base for relative rotation about said axis; and



a load cell adjacent said other end and interconnecting said base and said housing.

4,182,167

YARN TENSION METER

Takao Nakayama, Otsu; Chikayasu Yamazaki, Kyoto, and Michio Ohno, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Sep. 7, 1978, Ser. No. 940,352
Int. Cl.[2] G01L *5/10*
U.S. Cl. 73—144 **6 Claims**

1. A yarn tension meter for measuring the tension of a running yarn comprising:

(a) a rotary guide having a yarn guide surface fixed on a rotating shaft, said shaft being driven by a motor;

(b) at least one force transducer for detection of contact pressure of the yarn on said yarn guide surface as an electrical signal; and

(c) fixed guide means arranged to provide a predetermined path for the running yarn;

said force transducer being disposed between said rotary guide and said fixed guide means.

4,182,168

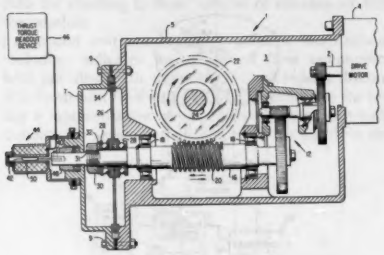
THRUST-TORQUE TRANSDUCER

John B. Desch, Brecksville, Ohio, assignor to Comptrol, Inc., Cleveland, Ohio

Filed Aug. 31, 1978, Ser. No. 938,645
Int. Cl.[2] G01L *3/10*
U.S. Cl. 73—140 **5 Claims**

1. A transducer for measuring the end thrust or torque output of a rotating shaft, comprising, a thrust bearing operatively connected to said shaft permitting an axial displacement of said shaft from a null position proportional to end thrust, an LVDT having a core element and a coil element, means operatively connected to said shaft axially positioning one of said elements relative to the other and rotating one of said elements relative to the other to produce a first output signal corresponding to the axial displacement of said shaft from the null position and

means maintaining said shaft in the null position comprising means responsive to said first output signal generating a feed-



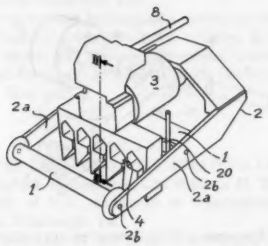
back thrust on said shaft proportional to but in opposite sense to the end thrust on said shaft.

4,182,169

TENSION DETECTOR FOR AN ADVANCING YARN LAYER

Michel Bardy, Mulhouse, France, assignor to Institut Textile de France, Bologne and Agence Nationale de Valorisation de la Recherche, Neully S, Seine, both of, France

Filed Oct. 5, 1978, Ser. No. 948,898
Claims priority, application France, Oct. 6, 1977, 77 30125
Int. Cl.[2] G01L *5/04*
U.S. Cl. 73—160 **5 Claims**



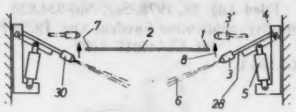
1. A tension detector for an advancing layer of straightened yarns, comprising a frame; and means mounted on said frame for guiding the layer along a V-path, said means comprising: two counter-bracing rollers mounted on said frame for rotation about parallel axes in a common plane, a rotatable feeler member, and a support member for mounting the feeler member in a frame with the longitudinal axis of the feeler member parallel to the axes of said counter-bracing rollers and situated between the latter, said support member including strain gauges, and means for moving said feeler member in the frame between first and second positions with respect to the common plane of the axes of said counter-bracing rollers, said first position being a fitting position which allows the passage of a plane of yarn between the rotating feeler member and the said counter-bracing rollers and said second position being the measuring position wherein the feeler member is located at a position between the bracing rollers at which a plane of yarn can no longer be inserted between the feeler member and the counter-bracing rollers; said support member including a cross-member and a plurality of parallel arms secured at one end on said cross-member, each arm having a side notch formed therein, and said feeler member comprising a plurality of coaxial rollers each of which is mounted in the notch of a corresponding arm, and each arm extending into a beveled free end.

4,182,170

DEVICE FOR CUTTING A FIBER WEB

Hans Grupp, Konigsbronn, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 856,089
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1976, 2656242
Int. Cl.[2] B26F *3/00*
U.S. Cl. 83—177 **15 Claims**



1. A device for cutting a web of fiber, paper or the like, comprising:

means for moving the web longitudinally;

a jet nozzle for spraying liquid on the web as the web is moving longitudinally and relatively to said jet nozzle; said jet nozzle including an outlet supported above the plane of the web, the plane of the web being the plane through which the web is moving at the location along the length of the web at which the liquid is to be sprayed;

a stationary support axis for supporting said jet nozzle with said outlet above the plane of the web as the web moves relatively to said jet nozzle;

said jet nozzle being swivelably mounted to said support axis for enabling swiveling of said jet nozzle in a jet nozzle swivel plane such that the spray of liquid traverses across the web and cuts the plane of the web during swiveling of said jet nozzle; means for swiveling said jet nozzle around its said support axis in said jet nozzle swivel plane as the web is moving longitudinally and relatively to said jet nozzle; said jet nozzle swivel plane intersecting the plane of the web.

4,182,171

NAVIGATION DEVICE FOR AIRCRAFT NAVIGATION

Ivan L. Looker, 300 E. Sheridan St., Watseka, Ill. 60970

Filed Apr. 3, 1978, Ser. No. 892,956
Int. Cl.[2] G01S *5/08*
U.S. Cl. 73—178 R **11 Claims**

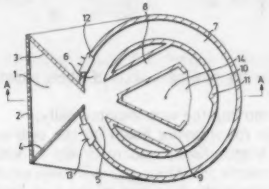
1. A navigation instrument comprising a fixed compass rose; one more more VOR radio station symbols mounted rotatably around the perimeter of said compass rose with each such station symbol having a line corresponding to a radial from such station symbol that would correspond with a map showing and extending across the face of the instrument through the center and to the perimeter of said compass rose opposite the station symbol, each such symbol being slaved to a radio receiver and rotatable automatically by the radio mechanism to the point on the compass rose indicating the direction to the station; an airplane symbol rotatably mounted in the center of the face of said instrument and connected to a compass mecha-

nism so that the direction of the aircraft is indicated by the nose of the symbol pointing to that direction on the compass rose.

4,182,172
FLOW METER

Lennart A. Wennberg, Rankhusvägen 51, 196 30 Kungsangen, and Ulf H. Danielsson, Paulus väg 21, 190 60 Bålsta, both of Sweden

Filed Aug. 18, 1978, Ser. No. 934,820
Claims priority, application Sweden, Aug. 19, 1977, 7709338
Int. Cl.[2] G01F *1/00*
U.S. Cl. 73—194 B **1 Claim**



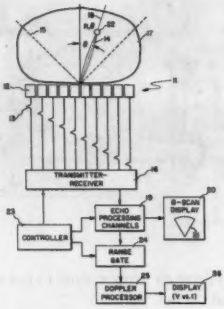
1. A flow meter of a fluidistor oscillator type with two interconnected control inlets located on each side of the connection between an inlet and two outlet ducts and with the inlet, the control inlets, the control duct and the outlet ducts located in one and the same plane and in which the oscillation is detected by the pressure waves that are formed in the control duct, characterized in that the inlet is fitted with a net over the orifice and is limited by two control surfaces, which give a wedge formed inlet, that the control duct runs circularly around the two outlet ducts, that the outlet is perpendicular to the direction of inflow and the plane that is formed by the inlet, the control inlets, the control duct and the outlet ducts and is located in the centre of the circle that is formed by the control duct, that a connecting duct between the rear ends of the two outlet ducts is fitted with a crest, which helps to guide the flow to the outlet, and that the oscillations are detected by means of a transmitter and a receiver for ultrasonics placed in the end-points of the control duct and directed towards a point on the symmetry plane of the flow meter located from the inlet somewhat beyond the centre of the control duct and on one half of the height between the top and the bottom of the meter.

4,182,173
DUPLEX ULTRASONIC IMAGING SYSTEM WITH REPETITIVE EXCITATION OF COMMON TRANSDUCER IN DOPPLER MODALITY

Emmanuel Papadofrangakis, Schenectady, N.Y.; John A. Fakiris, Holly Hill, Fla., and William E. Engeler, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 23, 1978, Ser. No. 936,115
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—194 A **14 Claims**

1. In a duplex ultrasonic imaging system having a common transducer array comprised of plural electroacoustic elements for transmitting and receiving pulses of ultrasound during a B-scan imaging mode and also during a subsequent Doppler mode in which the frequency shift of echoes relative to the ultrasound emission frequency spectrum caused by flow of blood or similar liquids in an insonified sample volume of the object being examined is measured to derive therefrom the flow velocity, the method of exciting said transducer array to vary the bandwidth of emitted ultrasound pulses which comprises in the B-scan modality applying a single impulse to every selected transducer element to generate a pulse of ultrasound with a broad bandwidth, and in the Doppler modality applying multiple impulses to every selected transducer element to generate a pulse of ultrasound with a narrow bandwidth, said

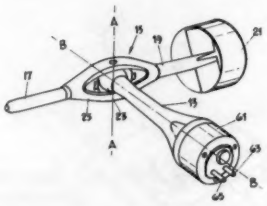


multiple impulses having a frequency approximately equal to the ultrasound emission center frequency.

4,182,174
HINGE JOINTS

Ronald K. Proctor, Maidstone, England, assignor to Elliott Brothers (London) Limited, Chelmsford, United Kingdom

Filed Jul. 14, 1978, Ser. No. 924,689
Claims priority, application United Kingdom, Jul. 25, 1977, 31108/77
Int. Cl.[2] G01F *1/46, 15/18*
U.S. Cl. 73—212 **10 Claims**



1. A head for sensing fluid flow pressure comprising a swivelling pitot tube adapted to be mounted in the fluid and to align itself with the direction of fluid flow wherein the pitot tube is mounted on a hinge joint comprising: a hollow first member into which a hollow pivot pin extends from a second member of the hinge joint to which the pitot tube is fixed so that the first member and the pitot tube are capable of relative angular movement about the pivot pin axis; a hollow shaft which extends lengthwise along the interior of a tubular projection of the first member; a coupling between the pivot pin and the shaft which converts angular movement of the pitot tube, with respect to the first member, about the pivot pin axis to rotary movement of the shaft relative to the tubular projection; and a flexible tubular connection between the pivot pin and the shaft to provide a passageway through the joint for the transmission of fluid pressure from the pitot tube.

4,182,175
SPIROMETER

John R. Boehringer, 427 Parkview Dr., Wynnewood, Pa. 19096

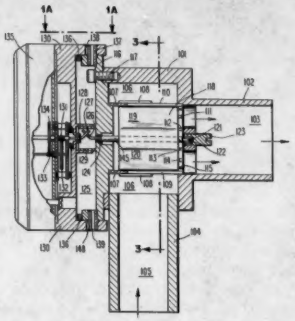
Filed Dec. 27, 1977, Ser. No. 864,523
Int. Cl.[2] G01F *1/07, 1/08*
U.S. Cl. 73—229 **21 Claims**

1. A spirometer comprising:

(a) a first unit of use in obtaining pulmonary measurements of a user and requiring periodic sterilization including a

conduit having an inlet port for receiving patient's exhaled air, and an outlet port, and defining a flow path therebetween, flow responsive turbine means disposed in the flow path for reacting to flow volume of exhaled air through the conduit;

(b) a second unit not requiring periodic sterilization and including indicator means out of flow communication with said flow path, connected to and readily disconnectable from said flow responsive turbine means for providing a representation of air volume passing through said condiut, for separation of said unit from said first unit for



sterilization of first unit, including means isolating said indicator means from said air flow path;

(c) mutually cooperative connecting means matably provided on each said unit for ready release and detachment of said indicator means from said conduit for separation of said indicator therefrom; and

(d) mechanical motion transmission means in operative direct mechanical interconnecting relation between said indicator means and said turbine means, from a location within said flow path to a location out of communication with said flow path.

4,182,176

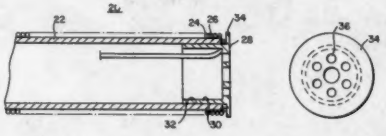
LIQUID LEVEL SENSOR WITH IMPROVED LINEARITY

Kerwin C. Playfoot, Horseheads, and William H. Todt, Elmira Heights, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 24, 1976, Ser. No. 699,272

Int. Cl.[2] G01F *23/28*

U.S. Cl. 73—290 R **3 Claims**



1. A liquid level sensor of the bifilar wound inductive coil type in which the coil is wound on a support sleeve having an end support member connected to the sleeve end which is insertable into a closed end tubular thimble which is insertable into a conductive liquid which tubular thimble has a thinned wall portion proximate to the closed end, the improvement wherein the coil is wound to the end of the support sleeve, and the end support member comprises a tubular end support portion, part of which is fitted within and supported from the interior wall of the support sleeve, and a generally planar end portion disposed at the end of the tubular end support portion which extends from the support sleeve normal to the longitudinal axis of the tubular end support portion and extending radially beyond the outside diameter of the bifilar coil on the support sleeve but extends less than the inside diameter of the tubular thimble.

4,182,177

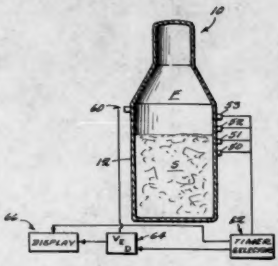
SOUND EMISSION LEVEL DETECTION

James R. Prough, Glens Falls, N.Y., assignor to Kamyr, Incorporated, Glens Falls, N.Y.

Filed May 19, 1978, Ser. No. 907,858

Int. Cl.[2] G01F *23/28*

U.S. Cl. 73—290 V **27 Claims**



1. A solids level detecting assembly comprising solids flowing downwardly therein with a sound conducting fluid in a fluid phase above the level of solids, and having a generally vertical axis,

a plurality of sound receivers mounted at spaced vertical positions to the exterior of said vessel,

means for periodically generating sound waves in the fluid phase of the vessel above the level of solids,

means for evaluating the sound energy received by said receivers in response to the generated sound waves by evaluating the energy levels of individual frequencies of sound waves to determine the level of solids relative to two or more of said receivers; and

a filter associated with said receivers and evaluating means for reducing the response of all sound received by said receivers except that at a particular predetermined frequency.

4,182,178

METHOD AND APPARATUS FOR MEASURING A CHANGE IN SURFACE LEVEL OF A LIQUID

David G. Nolte, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 840,932, Oct. 11, 1977, abandoned, which is a continuation of Ser. No. 713,087, Aug. 9, 1976, abandoned. This application Jul. 17, 1978, Ser. No. 925,135

Int. Cl.[2] G01F *23/14*

U.S. Cl. 73—299 **11 Claims**

1. Senstive J-tube instrument for measuring change in the surface level of a fluid in an underground tank or the like, comprising

a U-tube portion containing an indicator fluid therein,

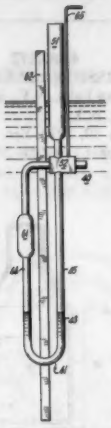
said U-tube portion having a predetermined inside cross-sectional area,

one leg of said U-tube portion being connected to a larger inside cross-sectional area tube to form the taller leg of said J-tube,

said larger inside cross-sectional area tube being long enough to extend from above the maximum surface level of said fluid being measured to below the minimum surface level thereof, and

valve means for connecting each of said U-tube portion legs

with said fluid being measured and for isolating said taller leg,



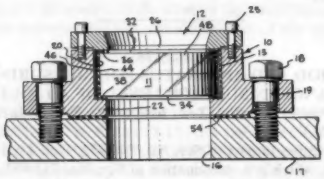
said valve means being connected above the tops of said indicator fluid.

4,182,179

SIGHT GLASS ASSEMBLY

Charles E. Meginnis, 529½ Nancy St., Charleston, W. Va. 25302

Filed Feb. 14, 1978, Ser. No. 878,189
Int. Cl.[2] G01F *23/02*
U.S. Cl. 73—334 11 Claims



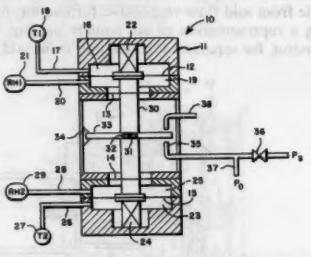
1. A sight glass assembly comprising a housing structure mountable on a vessel for containing fluid, said housing structure having an opening therethrough, said opening having an enlarged section providing a shoulder, a lens disposed in the enlarged section of the opening in said housing structure and against said shoulder, a packing member disposed in the enlarged section of said opening between said housing structure and the periphery of said lens, said packing member having a side engageable with said shoulder and a side opposite said shoulder engageable side, said packing member being hollow sealed and at least partially filled with a fluid, and means engageable with said opposite side of said packing member for applying a force on said packing member in the direction of said shoulder for causing said packing member to exert a uniform compressive force about the periphery of said lens to place the lens in lateral compression and effect a seal between said housing structure and the periphery of said lens.

4,182,180

ENTHALPY COMPARATOR

Richard C. Mott, Harwood Hts., Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 26, 1977, Ser. No. 800,762
Int. Cl.[2] G01K *17/00*
U.S. Cl. 73—336 20 Claims



1. A fluidic enthalpy comparator for comparing the enthalpies of first and second bodies of air comprising:

first and second temperature sensors for providing first and second respective pressures dependent upon the temperatures of respective first and second bodies of air;

first and second humidity sensors for providing respective third and fourth pressures dependent upon the humidities of said respective first and second bodies of air;

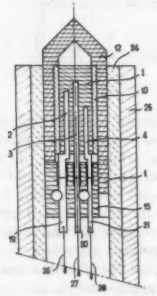
a diaphragm module unit having a first diaphragm defined chamber connected to said first temperature sensor for receiving said first pressure, a second diaphragm defined chamber connected to said second temperature sensor for receiving said second pressure, a third diaphragm defined chamber connected to said first humidity sensor for receiving said third pressure, and a fourth diaphragm defined chamber connected to said second humidity sensor for receiving said fourth pressure, and output means responsive to said pressures within said first, second, third and fourth diaphragm defined chambers for providing a proportional output signal dependent upon the enthalpies of said first and second bodies of air.

4,182,181

PROCESS AND APPARATUS FOR MEASURING THE TEMPERATURE OF A BATH OF MOLTEN METAL

Tibor Arvai, Monte Carlo, Monaco, assignor to "Meci" Materiel Electrique de Controle et Industriel, Plaisir, France

Filed Jul. 17, 1978, Ser. No. 925,355
Int. Cl.[2] G01K *1/00*
U.S. Cl. 73—339 R 11 Claims



1. A process for measuring the temperature of a bath of molten metal, comprising the steps of bringing a heat sensitive

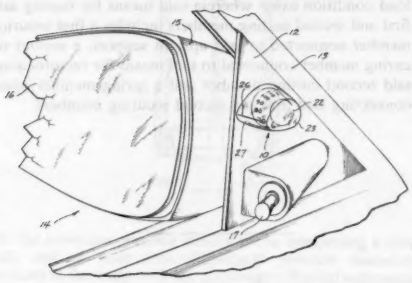
element into contact with the molten metal, permitting a portion of the element comprising an electrically insulating material to be progressively destroyed by combustion on contact with the molten metal, and measuring the duration of combustion of a predetermined length of the insulating material.

4,182,182

VEHICLE THERMOMETER FOR MEASURING OUTSIDE TEMPERATURE

Robert K. Stortz, Brookfield, Wis., assignor to Harman International Industries, Inc., Southfield, Mich.

Filed Sep. 5, 1978, Ser. No. 939,785
Int. Cl.[2] G01K *1/14, 13/02*
U.S. Cl. 73—343 R **7 Claims**



1. A thermometer for indicating inside an enclosed vehicle the temperature outside the vehicle wherein the vehicle has a rear view mirror mounted in a housing, including a temperature indicator and a sensing unit coupled to said temperature indicator; wherein the improvement comprises means mounting said temperature indicator within the driver's compartment; means supporting said sensing unit outside the driver's compartment within the mirror housing for protecting said sensing unit from damage while exposing it to the outside air; means for admitting the outside air into said housing to encompass said sensing unit so that its temperature corresponds to the temperature of the outside air; and means insulating said sensing unit from the air inside the vehicle.

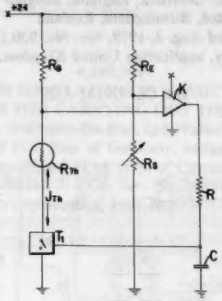
4,182,183

THERMISTOR CIRCUIT

Gerhard Funk, Meckenbeuren; Eberhard Weller; Hans-Dietrich Renovanz, both of Biberach, an der Riss, and Uwe Papendick, Ummendorf, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed May 26, 1978, Ser. No. 910,067
Claims priority, application Fed. Rep. of Germany, May 31, 1977, 2724558
Int. Cl.[2] G01K *7/24*
U.S. Cl. 73—362 AR **4 Claims**

1. A thermistor circuit, wherein a thermistor, a current-limiting resistor, a complementary resistor and a desired-value variable resistor are connected together in the form of a resistance bridge, where one diagonal of the resistance bridge is linked to a comparator, and the output of the comparator is connected to a bridge feed point of the other diagonal of the



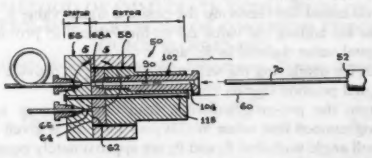
resistance bridge via an RC element consisting of a resistor and capacitor and via a switching transistor.

4,182,184

SAMPLE INJECTOR

Stephen R. Bakalyar, Berkeley, and Reginald E. Sylvester, Hercules, both of Calif., assignors to Rheodyne Incorporated, Berkeley, Calif.

Filed Dec. 14, 1978, Ser. No. 969,331
Int. Cl.[2] G01N *1/10*
U.S. Cl. 73—422 GC **23 Claims**



1. A sample injector device for receiving a sample to be analyzed from an injector tube and transfering the sample to an analyzing instrument, comprising:

a stator element;

a rotor element rotatably mounted on said stator element about a predetermined axis, said elements having facewise adjacent faces;

a first of said elements having a plurality of ports open to said face thereof;

a second of said elements having a tube-receiving passage open to the face thereof to communicate with ports in said first element;

said tube-receiving passage extending through said second element, along a straight line to the face thereof, so the face end portion of the tube-receiving passage can receive a straight injector tube with its tip lying at the interface of said elements, and said first element having a port with an end that is aligned with said tube-receiving passage and that is narrower than the face end of said tube-receiving passage, whereby the injector tube can lie flush against the face of the first element.

4,182,185

DISPLAY DEVICE FOR ROTARY BALANCING MACHINES

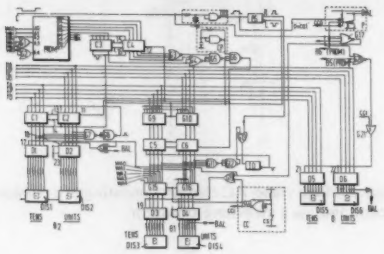
Brian M. Forster, Sheffield, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed Aug. 2, 1978, Ser. No. 930,179

Claims priority, application United Kingdom, May 24, 1978, 21981/78

Int. Cl.[2] G01M *1/22*

U.S. Cl. 73—462 **6 Claims**



3. In a rotary balancing machine of the kind which generates a digital out of balance weight signal of a value defined as W and a digital out of balance position signal of angle defined as θ with respect to a datum angle to give an indication of the value and position of a weight required for balancing purposes, a display device for indicating digital position values at which weights of predetermined uniform value defined as W_1 should be placed to give a resultant balancing effect equivalent to weight W at θ, the display device comprising;

a pre-programmable read only memory arranged to receive said weight signal, said memory being pre-programmed to provide a digital output $\Delta\theta$ equivalent to an angle arc COS $(W/2W_1)$ when W is in the range such that $W/2W_1 < 1$,

first means for-receiving the position signal value θ,

means for subtracting the value $\Delta\theta$ from the value θ to provide a digital value defined as θ_1,

second means for receiving the position signal value θ,

means for adding the value $\Delta\theta$ to the value θ to provide a digital value defined as θ_2, and

means for displaying the values of θ_1 and θ_2 to provide said digital position signals for weights W_1,

wherein the pre-programmable read only memory is so programmed that when $W/2W_1 = 1$ then $\Delta\theta$ is given as a small angle such that θ_1 and θ_2 are approximately equal to θ but are spaced a finite distance to enable the application of two independent weights of value W_1.

4,182,186

NOTCHING MECHANISM

Louis W. Hirsch, 411 Windsor Rd., Englewood, N.J. 47631

Filed Mar. 28, 1978, Ser. No. 890,975

Int. Cl.[2] B26D *3/14*

U.S. Cl. 83—467 R **9 Claims**

1. A notching mechanism which comprises:

a base;

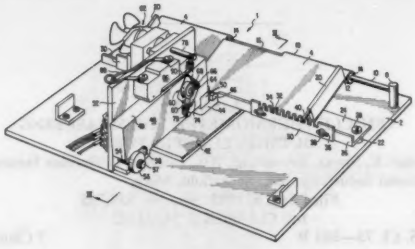
an upright support secured to and vertically projecting from said base;

means for supporting an object to be notched mounted on said base adjacent to said upright support;

first and second cooperating cutting members, said first cutting member being fixedly secured to said base and said second cutting member being connected to said upright support;

means for reciprocating said second cutting member, mounted to said upright support, so as to operatively cooperate with said first cutting member and thereby form a notch in said object; and

means for biasing said first and said second cutting members into cooperating engagement and means for allowing shifting of said second cutting member from cooperating engagement with said first cutting member when an over-



load condition exists wherein said means for biasing said first and second cutting members includes a first securing member connected to said upright support, a second securing member connected to said means for reciprocating said second cutting member and a spring member interconnecting said first and second securing members.

4,182,187

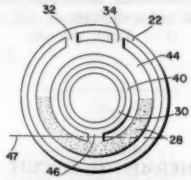
FORCE BALANCING ASSEMBLY FOR TRANSDUCERS

Richard A. Hanson, Woodinville, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Apr. 24, 1978, Ser. No. 899,607

Int. Cl.[2] G01P *15/08*

U.S. Cl. 73—497 **22 Claims**



1. A force balancing assembly for use in a force sensitive instrument comprising;

a support member;

a force sensing movable member

means including at least one first hinge element for mounting said force sensing movable member on said support member

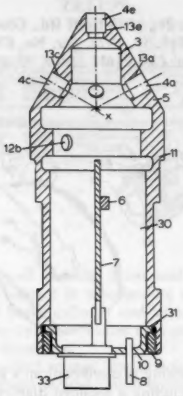
a force restoring element; and

means including at least one hinge element for mounting said force restoring element on said movable member wherein said means is effective to permit movement of said force restoring element with respect to said movable member.

4,182,188
AIRSTREAM PRESSURE SENSING PROBES

John W. Britton, and John N. Cannell, both of Bedford, England, assignors to Her Majesty the Queen in right of Great Britain, as represented by the Minister of National Defence, London, England

Filed Jun. 21, 1978, Ser. No. 917,728
Claims priority, application United Kingdom, Jun. 24, 1977, 26700/77
Int. Cl.[2] G01L 9/06
U.S. Cl. 73—721 8 Claims

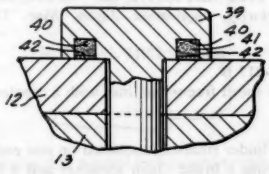


1. An airstream pressure sensing probe comprising a domed body and at least four diaphragm pressure transducers mounted in the body with the diaphragms thereof substantially flush with the domed surface and wherein one of the transducers is mounted in the apex of the domed surface and the other transducers are spaced around the domed surface equidistant from the apex-mounted transducer.

4,182,189
METHOD AND MEANS FOR ATTAINING A PREDETERMINED COMPRESSIVE STRESS

Carl G. Dock, and Nils G. Schrewelius, both of Hallstahammar, Sweden, assignors to Bulten-Kanthal AB, Hallstahammer, Sweden

Filed Mar. 14, 1978, Ser. No. 886,553
Claims priority, application Sweden, Mar. 15, 1977, 7702888; Mar. 30, 1977, 7703690
Int. Cl.[2] G01D 21/00
U.S. Cl. 73—761 23 Claims



1. A method for determining when a compressive stress of predetermined magnitude between a pair of contact surfaces, has been obtained comprising:

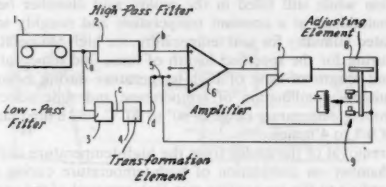
(a) applying a selected quantity of pressure sensitive explosive mixture between the contact surfaces, said explosive mixture comprising an explosive substance absorbed into a porous brittle body; and

(b) forcing said contact surfaces toward each other until said stress is reached, causing said mixture to change physically, whereby the mixture detonates and releases its intrinsic energy, thereby indicating that said predetermined stress has been attained.

4,182,190
METHOD FOR SIMULATING DYNAMIC LOADS AND APPARATUS FOR CARRYING OUT THE METHOD

Guntram Huber, Aidlingen-Dachtel, and Walter Schmid, Sindelfingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 7, 1978, Ser. No. 922,679
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2730914
Int. Cl.[2] G01N 3/32
U.S. Cl. 73—794 9 Claims

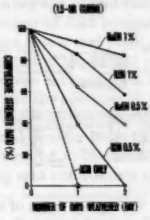


1. A method for simulating dynamic loads in structural parts of a vehicle with introduction of tensional, compressive, and torsional forces longitudinally, transversely, and vertically to a driving direction of the vehicle, comprising the steps of separating at least for one of the introduced forces a low-frequency component of the signal, transforming the thus separated component sectionwise to higher frequencies, and feeding the thus-transformed signal, displaced with respect to time, to the structural part to be loaded.

4,182,191
METHOD OF IMMEDIATE ESTIMATION OF COMPRESSIVE STRENGTH OF CONCRETE THROUGH QUICK HARDENING

Shoji Ikeda, 5-4-11, Yayoi-cho, Nakano-ku, Tokyo, Japan

Filed Sep. 6, 1978, Ser. No. 940,015
Int. Cl.[2] G01N 3/08
U.S. Cl. 73—803 6 Claims



1. A method of immediate estimation of compressive strength of concrete characterized by the compressive strength of concrete at the standard curing age of 28 days estimated accurately according to the steps (i) through (vi) hereinafter set forth within a short period of time from completion of mixing of concrete, said steps being:

(i) collection of the mortar portion of concrete through separation and removal of the coarse aggregate portion of concrete by wet screening with a 5-millimeter opening

sieve from a concrete sample collected from fresh concrete for which the mixing has been finished;

(ii) adding a setting accelerator and an alkali hydroxide to the mortar portion collected by the preceeding step (1) and mixing thereof, the setting accelerator being an alkali aluminate, or an alkali carbonate, or a mixture of the two, the amount of addition of the setting accelerator being 2 to 8 weight percent of the cement contained in the mortor portion, the amount of addition of alkali hydroxide being 0.5 to 3 weight percent of the cement contained in the mortar portion, and 10 to 50 weight percent of the setting accelerator;

(iii) filling of the mortar portion to which setting accelerator and alkali hydroxide have been added and which has been mixed according to the preceeding step (ii) in molds for forming rectangular parallelepiped specimens to cast specimens;

(iv) placing the specimens made according to the preceeding step (iii) in a high-temperature curing chamber in a condition while still filled in the molds, said chamber being maintained at a constant temperature and roughly saturated humidity for said temperature, for high-temperature curing for the specified length of time, said temperature and length of time of high-temperature curing being a suitable combination of temperature and time selected from a temperature range of 60° to 90° C. and a time range of 0.5 to 4 hours;

(v) removal of the molds from the high-temperature curing chamber on completion of high-temperature curing according to the preceeding step (iv), removal of the specimens contained inside, and performing compressive strength tests on the specimens;

(vi) the compressive strength of the mortar portion obtained by the preceeding steps (i) through (v) and the compressive strength of the original concrete at the standard curing age of 28 days being closely associated with each other, estimation of the compressive strength at the standard curing age of 28 days of the original concrete from the compressive strength of the mortar portion obtained by the preceeding steps (i) through (v) by utilizing the relation between the two compressive strengths.

4,182,192

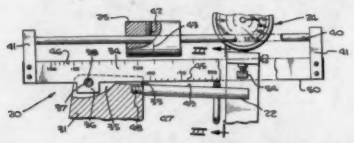
BEAM TYPE HARDNESS TESTER FOR ELASTOMERIC MATERIAL AND METHOD OF TESTING

George A. Argabrite, Malibu, and William C. Sanford, 22811 Macfarlane Dr., Woodland Hills, both of Calif., assignors to William C. Sanford, Woodland Hills, Calif., by George A. Angabrite and William C. Sanford

Filed Sep. 28, 1978, Ser. No. 946,772

Int. Cl.[2] G01N *3/14*

U.S. Cl. 73—818 **12 Claims**



1. An apparatus for testing hardness of elastomeric material of circular cross section, such as an O-ring, comprising, in combination:

a base structure;

a horizontal fixed anvil rod carried by said base structure;

a beam assembly pivotally mounted on the base structure extending along and above said anvil rod and including

a beam member and a selected weight element adjustably movable therealong,

and a scale bar having two linear scales thereon and extending parallel to said beam member,

said scale bar having a longitudinal edge cooperable with said anvil rod whereby said beam assembly is adapted to impart a compressive force on test material positioned between said scale bar edge and said anvil rod;

and means for measuring the vertical position of said beam assembly when material being tested is positioned on said anvil rod at a location corresponding to the selected location of the weight element according to said scales on said scale bar.

4,182,193

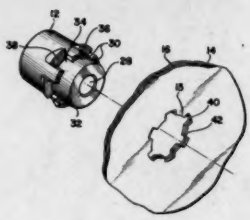
PULLEY

Edward H. Schultz, Jr., 1055 Bluff Rd., Glencoe, Ill. 60022

Filed Feb. 13, 1978, Ser. No. 876,993

Int. Cl.[2] F16H *55/44, 55/46*

U.S. Cl. 74—230.8 **10 Claims**



1. A pulley comprising in combination: a generally cylindrical elongate hub including a reduced diameter portion at one end thereof and having thereon a peripheral array of radially extending shoulders defining spaced lands and grooves extending axially thereof toward the opposite end of the hub, and a plurality of peripherally spaced radial tabs at the inner ends of said grooves extending beyond said lands and spaced axially from said shoulders a predetermined axial distance toward the opposite end of the hub; composite annular sheet material members in side-by-side position presenting an outer belt receiving groove and inner opening means complementally shaped to interfit with the lands and grooves to prevent rotation thereof relative to the hub and disposed to substantially fill the space along said predetermined axial distance between the tabs and shoulders; and shoulder means adjacent the said one end of the hub engaging the adjacent sheet material member to cooperate with the tabs in securing the composite sheet material members against axial movement relative to the hub.

4,182,194

FREE WHEEL HUB WITH COASTER BRAKE

Yoshiaki Tomozawa, No. 9-25, 1-chome, Kohamanishi, Suminoe-ku Osaka, Japan

Filed Mar. 9, 1978, Ser. No. 884,758

Claims priority, application Japan, Mar. 11, 1977, 52-29896[U]

Int. Cl.[2] G01F *3/24, 3/28*

U.S. Cl. 74—217 B **3 Claims**

1. A multi-speed free-wheel hub with a coaster brake comprising;

an axle;

a brake cylinder rotatably mounted on one end of said axle and having a brake chain sprocket and a thread on its outer surface;

a drive cylinder rotatably mounted in concentric arrangement on said brake cylinder and having a set of speed change sprockets and a thread on its outer surface;

a hub drum rotatably supported on said drive cylinder at one end and on said axle at the other end and having a conical inner surface;

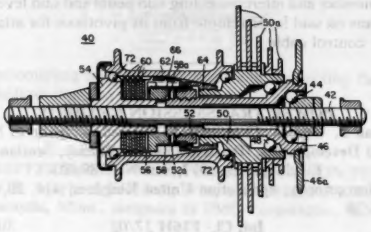
a friction disc brake mechanism located at the other end of said axle and operatively disposed between said axle and

said hub drum for braking said hub cylinder against said axle;

a first clutch member rotatable about and axially movable on said axle to move said brake mechanism between a braking position and a release position;

a second clutch member thread fitted on said thread of said brake cylinder and axially movable thereon to engage and disengage with said first clutch member;

a drive cone thread fitted on said drive cylinder and having a conical outer surface friction-engageable with said conical inner surface of said hub drum, said drive cone being concentrically located in surrounding arrangement with respect to said brake cylinder and being axially movable when said drive cylinder rotates to engage and disengage with said hub drum; and



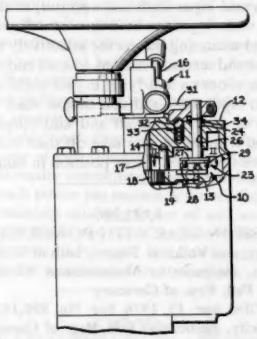
spring means attached to said first clutch member and disposed between said second clutch member and said drive cone in a friction contact relationship for transmitting a predetermined circumferential force by friction therebetween.

4,182,195

TRANSMISSION SHIFT CONTROL LOCK ASSEMBLY

John W. Grant, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 28, 1978, Ser. No. 937,232
Int. Cl.[2] G05G *5/00*
U.S. Cl. 74—473 SW **4 Claims**



1. A transmission shift control lock assembly (**10**) for a transmission shift control (**11**) having a support structure (**12**) and a lever (**13**) pivotally connected to the support structure (**12**), said lever (**13**) being pivotal in an arcuate pathway in a first plane between first and second positions at which the transmission is in forward and reverse drive conditions, respectively, said lever (**13**) having an intermediate position at which the transmission is in neutral, comprising:

a crank (**23**) rotatably connected to the support structure (**12**) and having a member (**27**) which has first and second lever engaging portions (**28,29**) thereon, said member (**27**) being rotatable in a plane substantially parallel to said first plane between a first position at which the lever engaging portions (**28,29**) are spaced from the lever (**13**) and the lever (**13**) is free to move between said first and second positions and a second position at which the first and second lever engaging portions (**28,29**) engage and maintain the lever **13** at the intermediate position; and

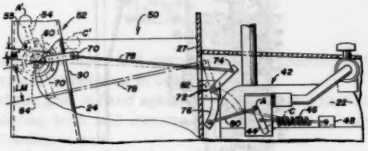
means (**31**) for rotating the crank (**23**) between said first and second positions.

4,182,196

THROTTLE CONTROL MECHANISM

Emmett F. Glass, Akron, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Continuation of Ser. No. 641,416, Dec. 17, 1975, abandoned.
This application Mar. 20, 1978, Ser. No. 888,445
Int. Cl.[2] G05G *1/00, 1/04*
U.S. Cl. 74—491 **6 Claims**



1. An improved throttle control mechanism for a vehicle driven by an internal combustion engine having a throttle lever movable over a range between shut-off and full-throttle positions, said throttle control mechanism comprising:

(a) a control arm rotatably mounted about a pivot point on the frame of said vehicle for movement between first and second limit positions corresponding respectively to the shut-off and full-throttle positions of said throttle lever, said control arm including a pivotable radially extending lever, a frictional engaging portion and an integral handle extending from said portion for rotating said control arm;

(b) a friction lock operably associated with said frictional engaging portion to retain said control arm in any selected intermediate position between its limit positions;

(c) resilient means for biasing said throttle lever to the shut-off position; and

(d) means pivotally interconnected between said frictional engaging portion, said radially extending lever and said throttle lever for moving the latter between respective positions as said control arm moves between corresponding positions, said interconnecting means including a connecting link fastened to said radially extending lever whereby at least a portion of said radially extending lever and at least a portion of said connecting link are raised from a first position below said pivot point of said control arm to a second position above said pivot point when the control arm is moved between said first and said second limit positions so that the resulting moment on said control arm increases at a slower rate than the rate of increase of the moment on said throttle lever thereby decreasing the frictional force required to counteract said resulting moment for retaining said control arm in a selected position.

4,182,197

RAILROAD CAR HAND BRAKE

Roland J. Olander, LaGrange, Ill., assignor to Miner Enterprises, Inc., Geneva, Ill.

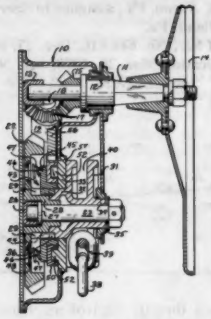
Filed Apr. 18, 1977, Ser. No. 788,345
Int. Cl.[2] G05G *1/08*
U.S. Cl. 74—505 **9 Claims**

1. In a hand brake mechanism for actuating the brake chain of a railway car which mechanism comprises a frame, a first shaft mounted in said frame and defining a first axis, a chain drum mounted on said shaft and rotatable about said axis, a

second shaft rotatably mounted in said frame and defining a second axis, a hand wheel secured to said second shaft, and drive means connecting said second shaft and said chain drum for transmitting a rotating force to said chain drum in response to the manual rotation of said hand wheel, the improvement comprising:

said second axis being substantially parallel to said first axis; and

said drive means including an interengaging worm and a worm wheel, said worm wheel defining a plane, said worm receiving said rotational force from said hand wheel and transmitting it to the worm wheel from whence



it is transmitted to the chain drum, said worm wheel being rotatable about said first axis, a third shaft defining a third axis positioned parallel to said plane, said worm being mounted on said third shaft for rotation about said third axis, a pair of interengaging bevel gears, one of said bevel gears being mounted on said second shaft for rotation about said second axis and operatively connected to said hand wheel for rotation therewith, the other of said bevel gears being mounted on said third shaft for rotation about said third axis and operatively connected to said worm for rotation therewith, whereby the drive means is self-locking so far as forces applied to the chain drum by the brake chain are concerned.

4,182,198

PEDAL CONTROL UNITS

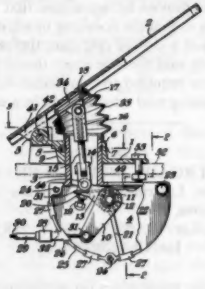
Jack Dartnell, Diplocks Way, South Rd., Hailsham, East Sussex, England (BN273JF)

Filed Feb. 17, 1977, Ser. No. 769,505

Claims priority, application United Kingdom, Jan. 11, 1977, 855/77

Int. Cl.[2] G05G *1/14*

U.S. Cl. 74—513 **14 Claims**



1. A pedal control unit including:

a mounting plate;

a pedal mounted on said plate to pivot about an axis substantially parallel to said plate;

a tubular member rotatably mounted in said plate and substantially perpendicular thereto;

a housing rotatable with said tubular member located on the opposite side of said plate to said pedal,

the interior of said housing being in communication with the interior of said tubular member;

a level located in, and pivotally mounted in said housing;

coupling means passing through the interior of said tubular member and interconnecting said pedal and said lever; and

means on said lever remote from its pivot axis for attaching a control cable.

4,182,199

POWER TRANSMISSION GEARBOX

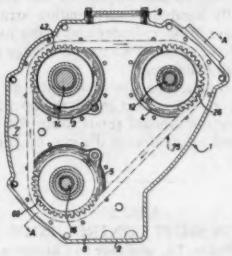
Norman F. Watson, Chipperfield, England, assignor to Stonefield Developments, (Paisley) Limited, Paisley, Scotland

Filed Apr. 19, 1977, Ser. No. 789,003

Claims priority, application United Kingdom, Apr. 20, 1976, 15922/76

Int. Cl.[2] F16H *57/02*

U.S. Cl. 74—606 R **11 Claims**



1. A power transmission gearbox comprising a housing; first mounting means mounting within said housing an input shaft, an output shaft and a power take-off shaft in a triangular pattern and with said input shaft and said output shaft lying in a plane sloping with respect to both the vertical and the horizontal; and second mounting means for selectively mounting said housing in first and second positions rotated end to end relative to one another about an axis lying in said plane and extending normal to said input shaft and said output shaft with the relative positions of said input shaft and said output shaft being unchanged and with said power take-off shaft being selectively in an upper position and a lower position in said housing.

4,182,200

TRANSMISSION GEAR WITH POWER BRANCHING

Hans Steinberg, and Volkmar Tepper, both of Witten, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 13, 1978, Ser. No. 896,142

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739596

Int. Cl.[2] F16H *37/06*

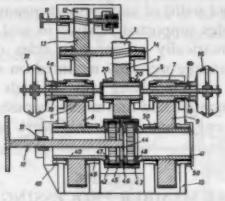
U.S. Cl. 74—664 **6 Claims**

1. Heavy duty transmission gear, such as a ship's drive gear including a housing and wherein a drive shaft is drivingly connected to two branches, each branch including two coaxial pinions, the two coaxial pinions of each branch respectively meshing with two large gears, the improvement comprising:

a first and second hollow shaft journalled in said housing in coaxial alignment with each other, but axially spaced apart defining a space in between;

an output shaft also journalled in the casing and traversing

one of said hollow shafts, and having one end extended into said space; and



gear coupling means in said space and connecting the two hollow shafts to the output shaft.

4,182,201

DIFFERENTIAL WITH FLOATING PINION PIN

Roger D. Mayhew, Fredonia, Wis., and Richard J. Chalmers, Champlin, Minn., assignors to FMC Corporation, San Jose, Calif.

Filed Aug. 1, 1977, Ser. No. 820,990
Int. Cl. F16h *1/40*
U.S. Cl. 74—713 **5 Claims**

1. (twice amended) In a differential having means defining a carrier mounted for rotation in a plane about a first axis, a pair of spaced bevel gears journaled in said carrier for differential movement relative to each other about said first axis, a shaft secured to each bevel gear, a pair of diametrically opposed pinions meshing with said bevel gears, and means defining a pair of diametrically opposed slots in said carrier extending transversely of the plane of rotation of said carrier; the improvement which comprises a floating pinion pin rotatably receiving said pinions and having elongated feet on opposite ends thereof that define flats which are longer than the diameter of said pinion pin and which are slidably received in said slots, [An apparatus according to claim 1 wherein] said pinion pin [includes] including two sections which each section including one of said elongated feet on its outer end; said pinion pin additionally comprising means defining bores in the inner ends of each pinion pin section, a dowel disposed within said bores to maintain axial alignment of said sections, and a spring disposed between one end of said dowel and the bottom of one of said bores to maintain full bearing engagement of said feet within the associated slots at all times.

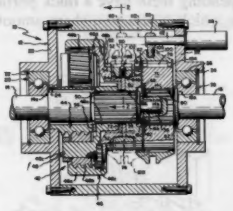
4,182,202

OVERDRIVE ATTACHMENT FOR A MOTOR VEHICLE

James S. Grey, Monk Hill Rd., Box 107 A, East Otto, N.Y. 14029

Filed Jan. 7, 1977, Ser. No. 757,628
Int. Cl.[2] F16H *57/10*
U.S. Cl. 74—781 R **3 Claims**

1. In an overdrive attachment for a motor vehicle including a non-rotatable casing; a rotatable input drive shaft; a rotatable output drive shaft; an epicyclic gear train including a sun gear; a planetary gear device meshing with said sun gear and fixed for rotation with said input drive shaft and a ring gear device meshing with said planetary gear device and supported for rotation relative to said input drive shaft; ; a first toothed coupling rotatively fast with said ring gear device; a second toothed coupling rotatively fast with said input drive shaft; and a vehicle operator controlled, axially movable toothed coupling fixed for rotation with said output drive shaft and arranged coaxial with said first and second toothed couplings, said axially movable toothed coupling being alternatively engageable with said first and second toothed couplings to provide for overdrive and direct drive connection conditions



between said input and output shafts, respectively, the improvement comprising in combination:

said sun gear is fixed against rotation relative to said casing during both said overdrive and direct drive connection conditions and

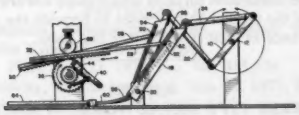
a synchronizing means is arranged operatively between said first and second toothed couplings to inhibit nonsynchroneous engagement of said axially movable toothed coupling therewith.

4,182,203

CONTINUOUSLY VARIABLE MECHANICAL TRANSMISSION

Marcus D. Drury, 2766 Doresta Rd., San Marino, Calif. 91108

Filed Feb. 24, 1978, Ser. No. 881,110
Int. Cl.[2] F16H *35/08*
U.S. Cl. 74—834 **19 Claims**



1. A variable speed transmission system comprising:

a plurality of lever arms mounted for oscillation about a mutually coincident axis;

oscillating means for oscillating said lever arms in a predetermined phase relationship about said axis;

a pushrod connected to each lever arm;

coupling means for coupling said pushrods to an output shaft; and

variable adjusting means for variably adjusting the point of connection of said pushrods to said lever arms with respect to said axis whereby the length of travel of said pushrods is varied.

4,182,204

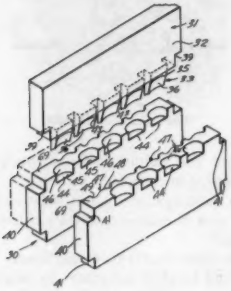
METHOD FOR MAKING FILE TEETH

James A. Coon, 929 Drever St., West Sacramento, Calif. 95691

Continuation-in-part of Ser. No. 595,403, Jul. 14, 1975, abandoned, which is a division of Ser. No. 478,766, Jun. 12, 1974, Pat. No. 3,913,420. This application May 25, 1977, Ser. No. 800,162
Int. Cl.[2] B23D *73/04*
U.S. Cl. 76—24 R **4 Claims**

1. A method of making file teeth comprising: providing a plurality of die elements each with opposed faces having substantially half of a recess thereon, assembling the plurality of

die elements in a die holder so that the juxtaposed faces of said die elements form complete recesses and an anvil, positioning a strip of metal on top of said anvil and over said recesses, moving a punch downwardly on said anvil, engaging the strip of metal with the punch, tearing a portion of said metal strip by virtue of the interaction of the punch against the anvil, deforming another portion of said metal strip proximate to the torn portion so as to form depending file teeth, performing the tearing and deforming in one step, and providing the punch with a configuration substantially complimental to the recess so that the depending teeth have a thick portion proximate to the metal strip which tapers to a sharp smooth edge; further



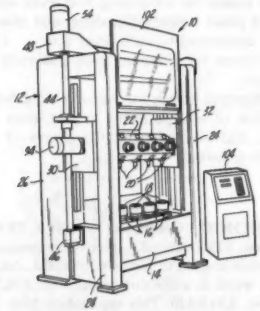
including forming a first half of the recess with a curved back surface which terminates in an inclined surface on one side of a reversible die, forming another side of the reversible die with second half recesses interrupted by intermediate portions in which the recesses have an initial vertically moderate inclined surface which continues thereafter to a deeper surface having a vertically more severe incline and providing the punch with a configuration complimental to the first half of the recess to register therewith, and opposite therefrom provide the punch with three continuous surfaces which slope towards the deeper surface of the second half recesses to provide the proper rake and clearance as well as coin all in one blow.

4,182,205

TURRET TYPE METAL WORKING MACHINE

Gary L. Baker, 527 James St., Portland, Mich. 48875

Filed Apr. 27, 1978, Ser. No. 900,435
Int. Cl.[2] B23B *3/34, 39/00, 39/16*
U.S. Cl. 82—3 **22 Claims**



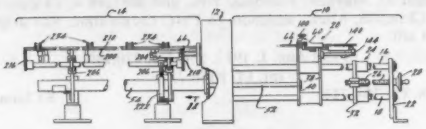
1. In a metal working machine comprising; a main supporting frame, means supporting a plurality of identical workpieces on said main frame for rotation about uniformly spaced parallel axes disposed in a common plane, an elongated tool support having means to support a set of tools corresponding in number and spacing to said plurality of workpieces, support means operatively disposed between said main frame and each of the opposite ends of said elongated tool support and each (being slidably engaged with) of said support means including a pair of parallel guides supported relative to said main frame and disposed symmetrically at opposite sides of said common plane, and a carriage movably mounted on each pair of said parallel guides and supporting opposite ends of said tool support for movement of said tool simultaneously into and out of metal working engagement with said work pieces.

4,182,206

CYLINDRICAL MEMBER PROCESSING APPARATUS

Barry C. Millar, Islington, and Keith W. Little, Georgetown, both of Canada, assignors to Bundy Corporation, Detroit, Mich.

Filed Jul. 15, 1977, Ser. No. 816,075
Int. Cl.[2] B26D *3/16, 7/02*
U.S. Cl. 83—56 **8 Claims**



1. A method of processing a plurality of elongated generally cylindrical members through apparatus for performing an operation on said members, said apparatus including operation performing means and a movable clamp assembly, said clamp assembly comprising a pair of relatively movable clamping surfaces and a pair of relatively movable holding surfaces, said method comprising:

placing a plurality of said elongated generally cylindrical members in a substantially flat parallel coplanar contiguous array within said clamp assembly and between said pairs of surfaces;

positioning and thereafter maintaining said holding surfaces apart a distance equal to the diameter of said members plus a predetermined clearance whereby said members are maintained in said substantially flat array;

actuating said clamping surfaces into clamping engagement with said members;

moving said clamp assembly in a direction so as to transport said members into said operation performing means; and

performing an operation on said members while continuing to maintain said clamping surfaces in clamping engagement with said members whereby they are retained in said substantially flat array.

4,182,207

FOOD STACK LOADER

William K. Switzer, and Roland W. Wagner, both of Cincinnati, Ohio, assignors to Chemetron Corporation, Chicago, Ill.

Filed Jan. 30, 1978, Ser. No. 873,177
Int. Cl.[2] B26D *4/44, 7/06, 7/24*
U.S. Cl. 83—61 **8 Claims**

1. A machine for loading stacks of sliced food obtained from a slicer to a packager comprising:

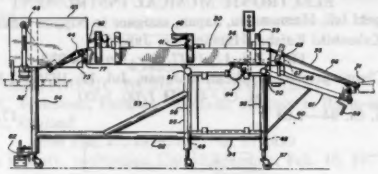
(a) a transmission adapted to be connected to a source of power;

(b) a placer connected to said transmission for rotation between a lower discharge position to a packager having a cavity and an upper pick up position, said placer having a pair of spring closed doors for support for a stack of sliced food;

(c) a ram mounted for reciprocation on said placer above said doors;

(d) first means for reciprocating said ram to force the stack through said doors into a cavity of the packager;

(e) an inclined slip-torque conveyor rotatably mounted on said transmission and driven by said transmission;
(f) second means for rotating said conveyor;
(g) a stop mounted on said conveyor at its lower end;
(h) third means for moving said stop between an extended and a retracted position;



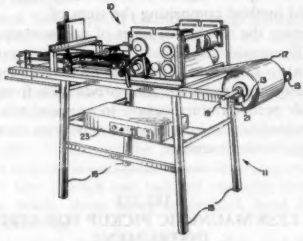
(i) and valve means driven by said transmission, said valve means actuating said second and third means to rotate said conveyor downward and retract said stop as said placer moves the stack via said doors downwardly toward said load position, where said valve means energizes said first means to ram the stack past the doors into the cavity, said valve means then reversing said first, second and third means prior to repeating the operation.

4,182,208

PLASTIC SHEET PERFORATING AND CUTTING MACHINE

Edward C. Bruno, Denver, and Harvey D. Reeme, Englewood, both of Colo., assignors to Polycraft Corporation, Denver, Colo.

Filed Sep. 26, 1977, Ser. No. 836,399
Int. Cl.[2] B26D *1/28*
U.S. Cl. 83—118 **10 Claims**



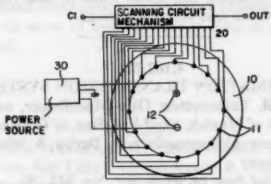
1. A machine for cutting and slitting thin flexible material formed in a substantially continuous web, said machine comprising:
first and second cooperating rollers mounted in close proximity for receiving and feeding said web therebetween; and,
a thin flexible knife blade mounted on the periphery of said first roller and extending in the longitudinal direction thereof, said flexible knife blade contacting said second roller for cutting said web at discrete intervals to form individual sheets as said material is fed between said rollers, said flexible knife blade being mounted on said first roller to freely flex and bend in the direction of rotation of said rollers as it engages said second roller while cutting said web to thereby increase the useful life of said flexible knife blade by providing bending, yielding contact with said second roller.

4,182,209

WAVEFORM GENERATOR

Masahiro Hibino, and Kenji Shima, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1976, Ser. No. 755,579
Claims priority, application Japan, Dec. 29, 1975, 50-157827; Jan. 22, 1976, 51-6066
Int. Cl.[2] G10H *1/02, 3/06*
U.S. Cl. 84—1.01 **11 Claims**



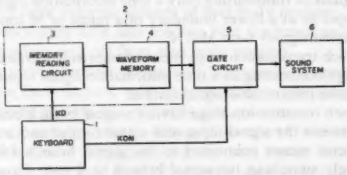
1. A waveform generator comprising:
a resistance plate;
a plurality of power source electrodes disposed on the resistance plate;
a plurality of potential detecting electrodes disposed on the resistance plate;
power source means for supplying a steady current to the power source electrodes to produce a potential distribution on the resistance plate; and
scanning circuit means connected to the potential detecting electrodes for periodically scanning potentials at the potential detecting electrodes to generate a voltage waveform.

4,182,210

KEYING SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

Tetsuo Nishimoto, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Aug. 21, 1978, Ser. No. 935,376
Claims priority, application Japan, Sep. 22, 1977, 52/105451
Int. Cl.[2] G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **8 Claims**



1. A keying system for an electronic musical instrument having a plurality of keys, each key corresponding to each musical note, comprising:
means for generating a key identification signal identifying an actuated key among said plurality of keys;
means for generating a key actuation signal representing a period of time during which the key is actuated;
a musical tone signal source for generating a musical tone signal according to said key identification signal and in response to the start of said key actuation signal;
means for detecting an amplitude at each instant of said musical tone signal to produce a detection signal each time when an absolute value of said amplitude falls within a reference range;
a gate circuit connected in a signal transmission line for

transmitting said musical tone signal to a sound system, said gate circuit controlling the transmission of said musical tone signal; and

a gate control circuit for rendering said gate circuit conductive in response to said detection signal after the start of said key actuation signal to transmit said musical tone signal and nonconductive in response to said detection signal after the termination of said key actuation signal to inhibit the transmission of said musical tone signal, thereby changing the condition of said gate circuit only when the absolute amplitude value of said musical tone signal is within said reference range.

4,182,211

INFORMATION TRANSMISSION SYSTEM

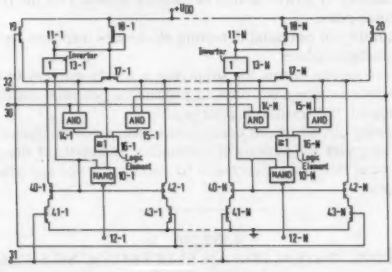
Klaus D. Bigall, Vaterstetten; Otto Muehlbauer, and Helmut Roesler, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 942,386

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 2742512

Int. Cl.[2] G10H *1/00*; H03H *11/00*

U.S. Cl. 84—1.01 **10 Claims**



10. An information transmission system for controlling tone information signals in an electronic organ, comprising:

(a) N transmission stage means for simultaneously transmitting N separate tone information signals, each transmission stage means transmitting one of the tone information signals or transmitting only a tone information signal at an upper or at a lower boundary of a range of M tone information signals with $M \leqq N$;

(b) each transmission stage means comprising a transmission stage connecting to a tone information signal input and to a tone information signal output;

(c) each transmission stage having a signal branch connected between the signal input and signal output and a control circuit means connected to the signal branch for selectively switching the signal branch to a tone signal pass-through mode;

(d) control signal means connecting to the control circuit means and comprising first, second and third control inputs;

(e) said control circuit means in each transmission stage comprising first and second gates each having first and second inputs and a logic element having first, second and third inputs, the first control input connecting to the first gate first inputs of all the transmission stages, the second control input connecting to the second gate first inputs of all the transmission stages, and the third control input connecting to the second input of the logic element, an output of the first gate connecting to the first input of the logic element and an output of the second gate connecting to the third input of the logic element in each transmission stage, an output of the logic element connecting to the signal transmission gate second input, and potential branch means connecting to the second inputs of the first and second gates.

4,182,212

METHOD OF AND APPARATUS FOR AUTOMATICALLY PLAYING ARPEGGIO IN ELECTRONIC MUSICAL INSTRUMENT

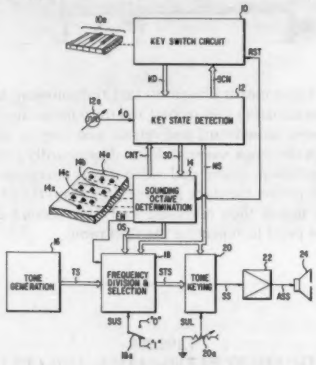
Sigeki Isii, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 12, 1977, Ser. No. 814,883

Claims priority, application Japan, Jul. 12, 1976, 51-82748

Int. Cl.[2] G10H *1/00, 5/00*

U.S. Cl. 84—1.03 **17 Claims**



1. A method for automatically playing arpeggio in an electronic musical instrument having keys for playing said instrument, key scanning means sequentially and repetitively scanning said keys at a high rate where a key is not depressed and at a low rate where a key is depressed to produce data signals identifying played keys among said keys, and tone producing means producing tone signals of tones designated by said data signals, said method comprising the steps of:

(a) counting the number of times of said scanning, and

(b) modifying said data signals by the number counted in said step (a) to shift in at least a one predetermined direction the designated notes for tone production from a first selectable predetermined octave to a second selectable predetermined octave in an amount of octaves corresponding to said counted number.

4,182,213

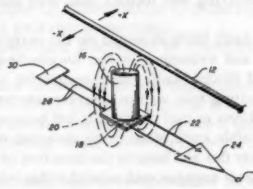
COIL LESS MAGNETIC PICKUP FOR STRINGED INSTRUMENT

Robert M. Iodice, 6540 Kirkville Rd., East Syracuse, N.Y. 13057

Filed May 3, 1978, Ser. No. 902,272

Int. Cl.[2] G10H *3/08*

U.S. Cl. 84—1.15 **10 Claims**



1. A stringed musical instrument having a magnetic pickup comprising:

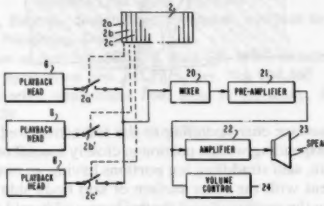
(a) at least one ferrous string arranged for vibration in a predetermined space;
(b) a permanent magnet mounted in spaced relation to said string such that the lines of magnetic flux emanating from said magnet intersect said space;
(c) a Hall effect sensor arranged with respect to said magnet so as to be permeated by said lines of magnetic flux and to have an electrical output responsive thereto; and
(d) electrical amplification means responsive to said sensor output.

4,182,214

ELECTRONIC MUSICAL INSTRUMENT

Richard C. Wakeman, Farnham, England, assignor to Birotronics Ltd., England

Filed Jan. 27, 1978, Ser. No. 872,899
Claims priority, application United Kingdom, Feb. 10, 1977, 5484/77
Int. Cl.[2] G10H *3/04*; G10G *3/04*
U.S. Cl. 84—1.28 **2 Claims**



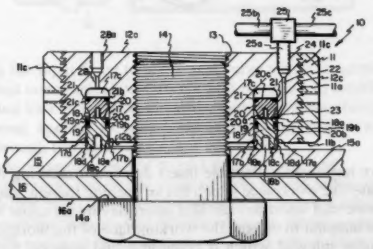
1. A musical instrument comprising:
(a) a longitudinally extending housing;
(b) guide means in said housing for indexing a plurality of magnetic tape cartridges in a predetermined side-by-side longitudinally extending relationship in which all of the indexed tape cartridges are adapted to be played, each indexed tape cartridge containing an endless magnetic tape having a plurality of tracks of sound intelligence recorded thereon;
(c) a playback head support extending longitudinally of the housing and slidably mounted therein for longitudinal movement, and a plurality of playback heads mounted on said support and operable continuously to transduce magnetic tape transported thereacross and thereby continuously produce an output signal;
(d) a common capstan mounted for rotation in the housing and operable to engage the pinch rollers of each tape cartridge indexed in said guide means for transporting said magnetic tape in each said indexed cartridge across said playback heads, there being a playback head for each indexed cartridge;
(e) track changing means operable to slide said playback head support longitudinally to move said playback heads across said tapes in said indexed tape cartridges from track to track, said track changing means comprising a roller carried by said support, a slide member arranged for reciprocal sliding movement transversely across said support and having a plurality of steps corresponding to the tracks on a tape at one end thereof, spring means biasing said support in a direction urging said roller into contact with said steps, and operating means for sliding said slide across said support, said roller being operable to ride up the steps against the bias of said spring means when the slide is moved in one direction and to ride down the steps under the action of said spring means when the slide is moved in the opposite direction;
(f) audio means connected to said playback heads for mixing said output signals and audibly broadcasting said mixed output signals; and
(g) manually operated keyboard means having a plurality of keys for selecting the sound information of a desired track of a desired tape, said keys being movable between a normally raised position and a depressed position, and a plurality of normally open switch means operated by said keys to remain closed for as long as a key associated with a switch means is manually held in the depressed position and to open when the key moves to the raised position, there being a key for each switch means and a switch means connected in circuit with each said playback head and said audio means, said audio means being operable continuously to broadcast an audible tone corresponding to the sound intelligence on the tapes selected by depressing one or more of said keys for as long as said keys are depressed.

4,182,215

FAILSAFE HYDRAULIC PRESTRESSING NUT

Sidney J. Green, Salt Lake City, and Randy R. Nielsen, Murray, both of Utah, assignors to Terra Tek, Inc., Salt Lake City, Utah

Filed May 30, 1978, Ser. No. 910,444
Int. Cl.[2] F16B *31/04*
U.S. Cl. 85—32 T **13 Claims**

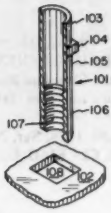


1. A failsafe hydraulic prestressing nut comprising,
a body portion that is circular in shape and has a center longitudinal hole formed therethrough that is internally threaded to be turned over a threaded item to receive tensile stressing, which body portion is also externally threaded;
a loading ring that is internally threaded appropriately for turning over external threads of said body portion;
means associated with said loading ring for breaking away said loading ring off from said body portion;
annulus means formed within said body portion open at a bottom face thereof, said annulus means extending into said body portion at a normal angle;
a primary annulas piston arranged to travel within said annulus means, having appropriate seal means therewith for prohibiting fluid passage between said primary annulus piston and said annulus means wall;
primary fluid transfer port means arranged in said body portion to pass fluid under pressure into said annulus means above said primary annulus piston;
a secondary annulus piston arranged to travel within said annulus means having appropriate seal means arranged therewith for prohibiting fluid passage between said secondary annulus piston and said annulus means wall;
secondary fluid transfer port means arranged in said body portion to pass fluid under pressure into said annulus-means above said secondary annulus piston;
means for selectively introducing fluid under pressure through said primary and secondary fluid transfer port means; and
a source of fluid under pressure.

4,182,216
COLLAPSIBLE THREADED INSERT DEVICE FOR PLASTIC WORKPIECES

Charles J. DeCaro, Marshfield, Mass., assignor to Textron, Inc., Providence, R.I.

Filed Mar. 2, 1978, Ser. No. 882,919
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—70 9 Claims



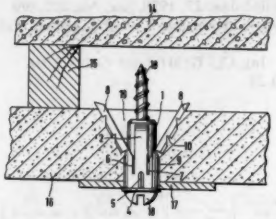
1. An improved collapsible insert device for securing items to a plate-like workpiece which has an opening therein adapted to receive said insert device, said insert having an upper head portion adapted to engage the working face of the workpiece, an annular sidewall which is collapsible and adjacent to said head portion, and a shank portion coaxially extending from the sidewall, said head portion, said sidewall and shank portions being integrally formed, wherein the improved insert device is adapted for securing to a plastic, plate-like workpiece, the improvement comprising a noncylindrical, noncollapsible collar having a cross-sectional width not less than said shank and interposed between said head portion and said sidewall, an integrally formed noncollapsible tapered section extending from the outer periphery of said collar to the sidewall, said collar having an axial thickness slightly greater than that of said plastic workpiece and a cross-sectional width less than the cross-sectional width of said opening in said plastic, plate-like workpiece, and said sidewall being collapsible to form a workpiece engaging annular edge which is radially outward from the opening when the sidewall is in a collapsed condition.

4,182,217
STRADDLING DOWEL CONSTRUCTION

Erich Runge, Kunzelsau, Fed. Rep. of Germany, assignor to Albert Berner, Kunzelsau, Fed. Rep. of Germany

Continuation of Ser. No. 749,697, Dec. 13, 1976, abandoned.
This application Jan. 19, 1978, Ser. No. 870,629
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558459
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—71 5 Claims

1. A straddling dowel comprising, in combination, an elongated tubular body of circular cross-sectional shape and having a side wall defining a central bore, said body including a neck portion at one end and an expanding wedge portion at the other end, a pair of bending straps arranged in diametrically opposed relationship on said body and connected at opposite ends to said neck portion and said expanding wedge portion, said bending straps having an outer surface coincident with the outer surface of said body side wall, a pair of wedge surfaces on said expanding wedge portion extending between the adjacent ends of said bending straps in diametrically opposed relationship with adjacent ends of said wedge surfaces defining a junction between said adjacent ends of said bending straps and said expanding wedge portion, a pair of leg portions each extending longitudinally of said dowel between the adjacent side edges of said bending straps and having a length which is substantially the same as said bending straps, said straddling leg portions having side edges disposed in closely spaced relationship with the side edges of said bending straps to define a slot and being connected at one edge to said neck portion, the other end of said straddling leg portions being provided with a

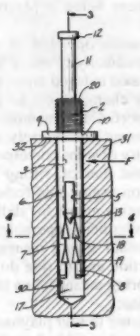


wedge surface corresponding to the respective wedge surface on said expanding wedge portion in closely spaced relationship therewith, said straddling leg portions having an outer surface coincident with the outer surface of said body side wall, and means on the portion of said central bore within said expanding wedge portion for engagement with a fastening element inserted through said neck portion to move said expanding wedge portion toward said neck portion wherein said bending straps are folded radially outward and said straddling leg portions are pivoted laterally outward by wedging engagement of said wedge surfaces on said expanding wedge portion successively with the wedge surfaces and the inner surfaces on said straddling leg portions for fixedly securing said dowel in an insertion hole or the like.

4,182,218
EXPANSION CORE ANCHOR

Marc Combette, Valence, and Jean Luthringer, Paris, both of France, assignors to Societe de Prospection et d'Inventions Techniques, SPIT, Bourg-les-Valence, France

Filed Oct. 13, 1977, Ser. No. 841,784
Claims priority, application France, Jan. 28, 1977, 77 02515
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—84 2 Claims



1. In an expansion core anchor of the type adapted to be

anchored in a predrilled hole in a receiving material, comprising a right-circular cylindrical body formed with a head and a crural end, said head being provided with an external peripheral thread and a circular bore in which is lodged in a nail-like expansion core, said crural end being divided by at least one slot into a plurality of deformable legs, said legs being adapted to be forced radially outwardly to grip the surface of the hole upon driving of said core toward said end; the improvement comprising: at least two pairs of axially limited internal projections, the ones of each pair being disposed adjacent longitudinal edges of said slot and situated one on either side of the axial plane perpendicular to the median plane of said slot, both of each pair of projections lying in a plane perpendicular to the axis of said body, one of said projections being disposed adjacent each edge of said slot, said projections each including a surface curved to conform to the shank of said expansion core, whereby said projections are adapted for guiding said expansion core during driving thereof.

4,182,219

HYDRAULIC CONTROL SYSTEM FOR TWO OPERATING CYLINDERS

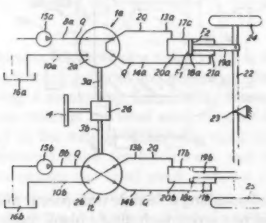
Johannes V. Baatrup, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 825,678, Aug. 18, 1977, abandoned. This application Sep. 21, 1978, Ser. No. 944,360

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2638239

Int. Cl.[2] **F01B** *1/00;* **F15B** *15/17*

U.S. Cl. 91—186 **6 Claims**



1. A hydraulic steering control system, comprising two hydraulic cylinders each having a piston with a piston rod extending through one end thereof, the rod side of each said piston having a smaller pressure area than the opposite side thereof, each of said cylinders having designated nonrod and rod ends with first and second ports respectively at the nonrod and rod ends thereof, a pivotally mounted steering lever having oppositely movable ends connecting said piston rods, fluid pressure source means and exhaust tank means, valve means for each of said cylinders, steering control means for operating said valve means in unison, said valve means having passages arranged so that turning said steering control means in one direction causes said first and second ports of one of said cylinders and said second port of the other of said cylinder to be connected to said fluid pressure source means and said first port of the other said cylinder to be connected to said exhaust tank means, and vice versa for turning in the other direction.

4,182,220

PUSH ROD ASSEMBLY

Keith H. Fulmer, Mishawaka, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 27, 1977, Ser. No. 864,166

Int. Cl.[2] **F01B** *15/02;* **F15B** *15/18*

U.S. Cl. 91—217 **9 Claims**

1. A push rod assembly comprising:

a first housing having a bore therein;

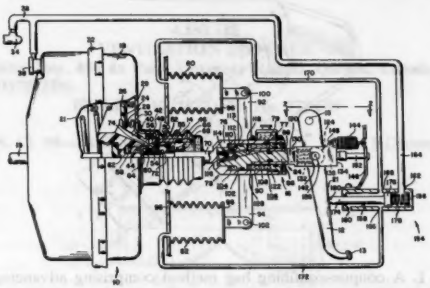
piston means cooperating with said first housing to define a first chamber and a second chamber in said bore, said piston means having a passage for connecting said first chamber with said second chamber;

valve means located in said passage;

linkage means connected to said valve means for operating said valve means to allow free communication of fluid between said first and second chambers;

actuator means responsive to an input force applied to said piston means for moving said first housing at a different rate than the input force moves said piston means causing said first chamber to expand and said second chamber to contract in size;

a retainer for inhibiting the movement of said linkage means



by the input force to allow said valve means to terminate fluid communication through said passage and establish a fluid lock in said first chamber, said input force thereafter being applied to said housing from the piston means through the fluid in said first chamber;

bellow means connected to said first housing; and

switch means responsive to movement of said piston means by the input force for allowing a source of vacuum to evacuate air from said bellow means to create a pressure differential thereacross with air in the surrounding environment, said pressure differential acting on said bellow means to move said first housing and aid in the establishment of said fluid lock.

4,182,221

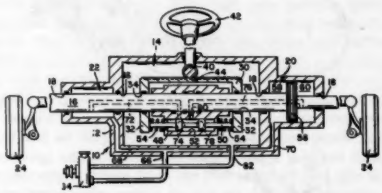
RACK AND PINION POWER STEERING

Rex W. Presley, Livonia, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 29, 1977, Ser. No. 811,112

Int. Cl.[2] **F15B** *9/10, 15/17*

U.S. Cl. 91—378 **8 Claims**



1. A device for steering a pair of dirigible wheels comprising:

a housing defining a cavity;

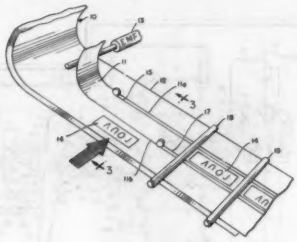
a pinion extending into said housing cavity;

a rack movably disposed within said housing cavity and engaging said pinion; and

a rod extending through said housing, said rack including at least one opening through which said rod extends, said rod carrying a valve member that is movable relative to said rod, said valve member cooperating with said rack to

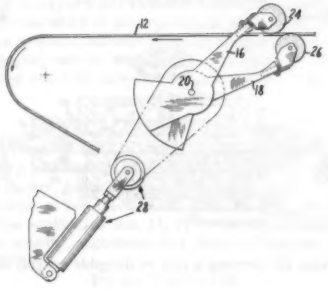
provide for movement of said rod relative to said housing, and said rod having a pair of ends extending outwardly from corresponding sides of said housing, each of said rod ends cooperative with a corresponding dirigible wheel.

4,182,222
COUPON CONFINING BAG METHOD
Robert L. Stahl, 3843 Grace La., Glenview, Ill. 60025
Filed Feb. 16, 1978, Ser. No. 878,478
Int. Cl.[2] B31B *1/72*
U.S. Cl. 93—35 R **3 Claims**



1. A coupon-confining bag method comprising advancing two continuous flexible thermoplastic webs toward one another for superposition, one web being wider than and extending past both longitudinal edges of the other web with at least the narrower web being transparent, longitudinally heat sealing the narrower web to the wider web along one longitudinal edge of the narrower web to develop a coupon-receiving pocket open along the other longitudinal edge of the narrower web, sequentially introducing coupons into said pocket from the open side thereon, longitudinally heat-sealing the narrower web to the wider web along the other longitudinal edge of said narrower web, and transversely severing said wider web between adjacent coupons.

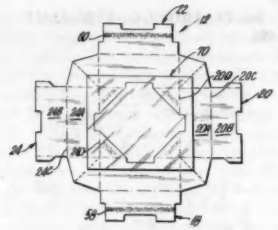
4,182,223
SWIVEL MOUNTING FOR TAPE APPLYING APPARATUS WIPE DOWN ROLLER
Saul Warshaw, R.D. No. 1, Box 227, Hawley, Pa. 18428, and Winton S. Loveland, Fort Salonga, N.Y. 11754
Filed Jun. 7, 1978, Ser. No. 913,539
Int. Cl.[2] B31D *1/60*
U.S. Cl. 93—36.9 **5 Claims**



1. In apparatus for applying tape to the end wall panels and the top and bottom panels of a carton and including a conveyor unit on which the carton is received and which is operable to convey said carton along a fixed longitudinal travel course with the end wall panels of the carton normally disposed transversely perpendicular to said fixed travel course, and a wipe down device for wiping down tape applied to said carton, said device including an arm rotatable about a fixed axis transverse perpendicular to said travel course, and a tape wipe down member fixed at the end of said arm and disposed generally transversely to said fixed course, said arm being movable such as to position said wipe down member in wipe down engagement with a carton end wall panel as said carton is conveyed along said travel course, the improvement wherein,

said wipe down member is rotatably mounted to the end of said arm thereby allowing said wipe down member to swivel for maintaining it in comformable wipe down engagement with a carton end wall panel which is skewed relative to said fixed course in a positioning other than transverse perpendicular therewith, and bias means carried on said arm and engaging with said wipe down member tending to maintain said wipe down member disposed transverse perpendicular to said fixed course.

4,182,224
METHOD OF INSTALLING PLASTIC WINDOW IN A BOX COVER
Daniel P. Dutcher, Woodbury, Minn., assignor to Champion International Corporation, Stamford, Conn.
Filed Mar. 3, 1978, Ser. No. 883,149
Int. Cl.[2] B31B *1/82*
U.S. Cl. 93—39 R **7 Claims**



1. A method of installing a flexible transparent plastic film in a box cover, said box cover including a blank made of opaque material and having a generally rectangular top panel hingedly connected to four side flap panels each provided with an inner and an outer segment hingedly attached to each other, and with said top panel having a central, generally rectangular opening therein, said blank further having tuck flaps each provided with a pair of hinged members hingedly connecting adjacent flap panels, said method comprising the steps of:

placing the blank in its flattened condition and applying adhesive means on the inside surface of the blank adjacent the rectangular opening;

providing the sheet of flexible transparent plastic film having a size greater than the size of said top panel and said central opening such that said flexible transparent plastic film overlaps the side flap panels and the tuck flaps of the blank;

bonding said sheet of flexible transparent plastic film to the inner surfaces of said blank using said adhesive means; and

simultaneously folding the side flaps and the tuck flaps of said blank to a generally orthagonal position relative to the plane of the top panel, said hinged members of each of said tuck flaps being folded into overlapping relationship with each other with portions of the edges of said film disposed on opposite sides of each of said pair of said overlapping hinge members.

then, folding and securing the outer segment of each of said side flap panels into overlapping relationship with the respectively associated inner segment whereby to enclose sections of said edges of said film between said inner and outer segments,

each pair of said overlapping tuck flap members being inter-

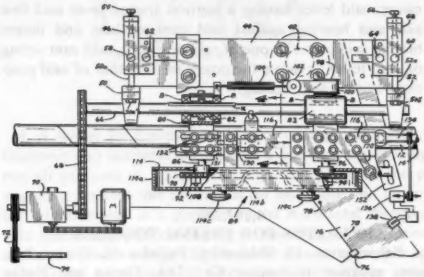
posed between the inner and outer segments of at least certain ones of said side flap panels with said film edge portions sandwiched between said tuck flap members and the panel segments of said certain side flap panels whereby to securely hold said film in position over said rectangular opening.

4,182,225

APPARATUS FOR PRODUCING FIBER CANS

Francis R. Reid, deceased, late of Minneapolis, Minn. (by Joan C. Reid, administrator), assignor to The Pillsbury Company, Minneapolis, Minn.

Division of Ser. No. 701,315, Jun. 30, 1976, Pat. No. 4,100,846.
This application Feb. 16, 1978, Ser. No. 878,213
Int. Cl.[2] B31C *3/00*; B26D *1/56*
U.S. Cl. 93—80 **10 Claims**



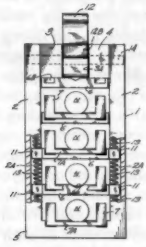
1. An apparatus for forming a collar cut in a fiber can from a sheet of body stock material and a sheet of label stock material comprising a supporting framework, means for winding the body stock material and label stock material into tube form with the label on the outside of the body stock material at least one knife mounted upon the framework and adapted to be positioned to engage can label stock material just before the label stock material is wound into tube form, and drive means for the knife to move the knife rectilinearly with respect to the tube and parallel to the axis of the tube being formed at the same velocity as the velocity component of the label material in the direction of knife movement.

4,182,226

NUTCRACKER

Costas A. Sigas, 134 SE. 12th Ave., Portland, Oreg. 97214

Filed Feb. 1, 1978, Ser. No. 874,574
Int. Cl.[2] A23N *5/00*; A47J *43/26*
U.S. Cl. 99—578 **6 Claims**



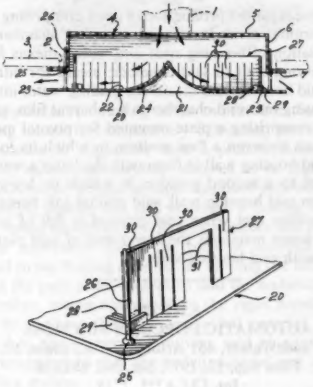
1. A nutcracker comprising in combination,
a base having a lengthwise orientated opening,
a series of spaced apart plate members slidably disposed in said opening to receive a nut thereon,
resilient means acting on said plate members urging same to a spaced apart relationship,
guide means embodied on said base and each of said plate members,
a lever pivotally attached at one of its ends to the upper end of said base for imparting a nut cracking force to a subjacent plate member and in a sequential manner to each of the remaining plate members, and
limit means carried by said plate members and limiting closing movement between plate members, said limit means also serving to transfer nut cracking forces from one plate member to another.

4,182,227

VENTILATION DIFFUSER

Michel Roy, 856 du Parc, Duvernay (Laval), Quebec, Canada (H7E 2T6)

Filed Feb. 17, 1978, Ser. No. 878,689
Int. Cl.[2] F24F *13/06*
U.S. Cl. 98—40 D **5 Claims**



1. A ventilation diffuser comprising a receptacle having a bottom and side walls, said side walls having free edges defining a receptacle open face spaced from said bottom, said receptacle adapted to be positioned in a recess of a ceiling in upside down position with the free edges of said side walls substantially flush with said ceiling, said bottom having an air inlet aperture means adapted to be connected to an air supply duct, an air deflector member in register with and extending across said open face and having a flat outer edge portion substantially parallel with said ceiling and extending outwardly of said side walls and downwardly spaced therefrom and defining with the free edges of said side walls an air outlet extending all around said receptacle, said air deflector member having an inner portion upwardly curving toward said bottom, progressively inward of said side walls, adjustable connection means between said air deflector member and said receptacle adjustably securing said air deflector member at a selected distance of its outer edge portion from the free edges of said side walls, partitions removably resting on said air deflector member and upstanding within said receptacle inwardly of said side walls and substantially parallel thereto, each partition having a continuous upper marginal portion and a series of tearable, elongated tabs downwardly projecting endwise from said upper marginal portion and juxtaposed side by side lengthwise of said partition, the free lower edge of said tabs defining the free lower edge of said partition, whereby said tabs can be selectively removed to produce air passages in selected directions relative to said receptacle, said air passages establishing a communication between said air inlet aperture means and said air outlet.

4,182,228

APPARATUS FOR THE PRODUCTION OF MASH

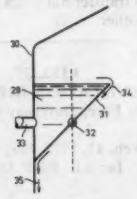
Simon Redl, Reichertshausen, and Johann Mooser, Freising, both of Fed. Rep. of Germany, assignors to Anton Steinecker Maschinenfabrik GmbH, Freising, Fed. Rep. of Germany

Filed Jul. 24, 1978, Ser. No. 927,420

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1977, 2739049; Mar. 1, 1978, 2808712

Int. Cl.[2] C12C *7/08, 5/00*

U.S. Cl. 99—276 **19 Claims**



1. Apparatus for the production of mash comprising a walled housing forming at its lower end a walled chamber for the accommodation of brewing malt and water; means for introducing brewing malt to said chamber; means for introducing water to said housing; and means for guiding water introduced to said housing into said chamber in a coherent film, said guiding means comprising a plate mounted for pivotal movement about an axis between a first position in which its lower end engages said housing wall to form with the latter a water-holding channel to a second position in which its lower end is spaced from said housing wall, said pivotal axis being located in such position that when said channel is full of water the weight of water maintains the lower end of said plate in engagement with said housing wall.

4,182,229

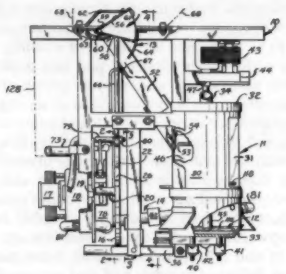
AUTOMATIC POPCORN MACHINE

James R. VandeWalker, 451 Arlington Ave., Elgin, Ill. 60120

Filed Sep. 12, 1977, Ser. No. 832,626

Int. Cl.[2] A23L *1/18*

U.S. Cl. 99—323.6 **7 Claims**



1. An automatic popcorn popping machine comprising in combination a frame, a generally cylindrical popping vessel defining a popping chamber, said vessel including a separable bottom cover for said chamber; cover operating means pivotally mounting said cover for movement about a first axis from a first position at which said cover is in juxtaposition to the remainder of said vessel to close said chamber for popping purposes and a second position at which said cover is displaced from the remainder of said vessel to permit the contents of said vessel to descend out of said chamber; electric heater means thermally connected to said cover for heating the cover; rotary stirring means extending into said vessel for moving the corn within said chamber; corn measuring and dispensing means communicating with said chamber for introducing a measured quantity of unpopped corn into said chamber; popping oil dispensing means communicating with said chamber for introducing a measured quantity of popping oil into said chamber; and power means operatively connected to said stirring means, said cover operating means, said corn dispensing means and said oil dispensing means for operating through a popping cycle and during that cycle rotating said stirring means and sequentially positioning said cover in said first position, introducing unpopped corn and popping oil into said chamber and, after sufficient time for said corn to have popped, positioning said cover in said second position, said machine being characterized by:

said power means including a cam rotating about an axis during the popping cycle and having a cam surface; and

said cover operating means including a lever pivotable about said first axis coincident with the pivotal movement of the cover, said lever having a portion spaced from said first axis and bearing against said cam surface, and means biasing said cover to one of said positions, said cam acting on said lever to move the cover to the other of said positions against said biasing.

4,182,230

APPARATUS FOR FRYING NOODLES

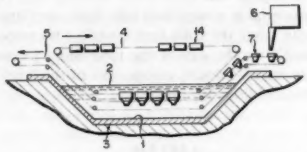
Hatuo Sakurazawa, 15 Shinozuka, Fujioka-shi, Gunma-ken, Japan, assignor to Acecoor Co., Ltd., Osaka and Hatuo Sakurazawa, Fujioka, both of, Japan

Filed May 9, 1977, Ser. No. 795,222

Claims priority, application Japan, May 19, 1976, 51-58224

Int. Cl.[2] A23L *1/16;* A47J *37/00*

U.S. Cl. 99—349 **1 Claim**



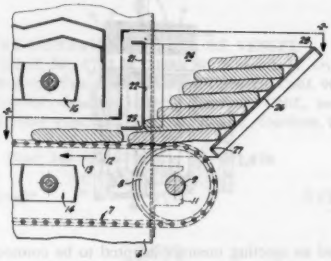
1. A noodle-frying apparatus comprising a frying oil tank, means for heating a frying oil in the frying oil tank, a plurality of liquid-permeable frying vessels, a plurality of open frames slidably fitted to the periphery of each vessel such that the frame telescopes over the periphery of the frying vessel without being detached from the frying vessel, means for spring biasing each frame relative to the frying vessel to cause the frame to extend sufficiently above the open end of the frying vessel to permit the inner volume of the frying vessel to be temporarily enlarged, a plurality of cap members each engageable with an open end of a corresponding frame in face to face relationship, first conveyor means for supporting the vessels equipped with the frames and for periodically positioning the same within the tank, and second conveyor means for conveying the respective cap members into the frying oil tank in synchronism with the vessels, said first and second conveyor means being located with respect to each other such that the distance between the two within the tank progressively narrows in the direction of travel of the two conveyors, whereby the temporarily enlarged inner capacity of the vessels equipped with the frames is gradually decreased by progressively increased force exerted by the cap members on the respective frames as the two conveyor means progress through the tank.

4,182,231

FROZEN PATTY FEEDER

Edward D. Baker, San Francisco; Nils Lang-Ree, Los Altos, and John S. Brown, Half Moon Bay, all of Calif., assignors to NPI Corporation, Burlingame, Calif.

Filed Jun. 26, 1978, Ser. No. 919,389
Int. Cl.[2] A47J *37/06*
U.S. Cl. 99—387 **6 Claims**



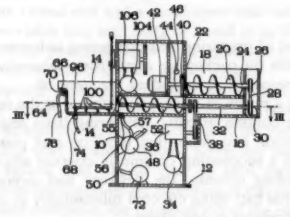
1. A feeder for frozen meat patties having a predetermined thickness and diameter comprising a broiler conveyor upper run all portions of which are below the plane of the patty engaging portions thereof; means for mounting said upper run for advancement in a predetermined horizontal direction; a first upstanding wall extending transversely of said direction and at its lower margin disposed above said conveyor upper run slightly more than said predetermined thickness; a second wall inclined to the vertical and extending transversely of said direction in advance of said first wall, said second wall at the bottom being substantially in said plane and being spaced from said first wall a horizontal distance substantially equal to said diameter, and said second wall at the top being horizontally spaced from said first wall substantially more than said diameter, whereby one of said patties can rest on said upper run and a plurality of said patties can rest on said one of said patties and on each other in step-wise fashion with the trailing edges of all of said patties resting against said second wall.

4,182,232

CURD MIXER FOR MAKING COTTAGE CHEESE

Stefano Tomatis, S. Lorenzo, Italy

Filed Jul. 31, 1978, Ser. No. 929,788
Int. Cl.[2] A01J *25/00*
U.S. Cl. 99—461 **14 Claims**



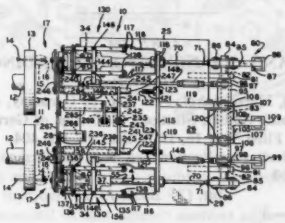
1. A curd mixer for making cottage cheese, comprising an elongated basin defined by an upwardly concave bottom wall and a pair of end walls, with an inlet opening in one of the end walls near the bottom of said basin and an overflow opening in the other end wall adjacent the top thereof, a mixer device with plunger arms provided with elongated mixer combs extending perpendicularly from said plunger arms parallel to said concave bottom wall, drive means for driving said plunger arms and a conveyor screw associated with said inlet opening for feeding curds and water to said basin.

4,182,233

STUFFING APPARATUS UTILIZING A MAGAZINE

Clemente del Ser Gonzalez, Pasco Talleres No. 36, Villaverde Alto, Spain

Continuation-in-part of Ser. No. 567,811, Apr. 15, 1975, Pat. No. 4,096,794. This application Mar. 7, 1977, Ser. No. 774,886
Claims priority, application Spain, Oct. 28, 1974, 431.436
Int. Cl.[2] A23N *4/08*; A23P *1/00*
U.S. Cl. 99—494 **8 Claims**



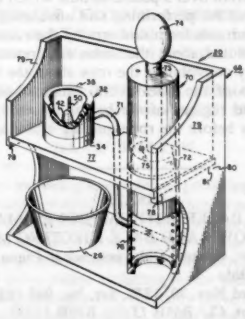
1. An apparatus for stuffing olives and the like, the apparatus comprising means for successively delivering said olives to a stuffing station in alignment with a predetermined path of movement; means for retaining material to be stuffed in the path of movement; a rigid member disposed between the olive in the stuffing station and said material; a folding member; a plunger; means mounting said folding member and plunger for individual movement along the path of movement; means connected to the folding member for moving the folding member along the path of movement to fold the material about the rigid member; means connected to the rigid member for removing the rigid member from the folded material; and means connected to the plunger for moving said plunger along the path of movement to stuff the folded material into the olive in the stuffing station.

4,182,234

NON-DESTRUCTING EGGSHELL EGG CONTENTS REMOVER

Winston H. Reed, 104 Mill St., Shelton, Conn. 06484

Filed Jan. 3, 1978, Ser. No. 866,625
Int. Cl.[2] A23B *5/00*
U.S. Cl. 99—495 **42 Claims**



1. A non-destructing eggshell contents remover comprising:
(A) an egg receiving cup assembly;
(B) an egg discharge tube having an end passing through the egg receiving assembly and protrudable into an egg

placed within said assembly for passage of the contents of the egg;

(C) an air inlet tube having an end protrudable into an egg placed within the egg receiving assembly, interacting with the egg discharge tube for passage of gas into the egg;

(D) means, interconnected with the air inlet tube, for forcing the passage of gas through said inlet tube into the egg; and

(E) a hand-holdable base having a region dimensioned for receiving the egg cup assembly, and also having a handle, the gas forcing means positioned on the base in proximity to the handle so as to be operable by the user's hand, whereby the contents of an egg are removed through the egg discharge tube while causing minimal damage to the eggshell.

4,182,235

METHOD AND ARRANGEMENT FOR BINDING ROUND BALES

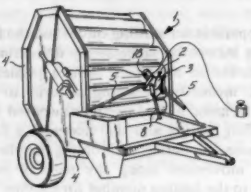
Horst Harig, Harsewinkel, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 16, 1978, Ser. No. 906,404

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1978, 2801309

Int. Cl.[2] B65B *13/18*

U.S. Cl. 100—3 **22 Claims**



1. A method of binding round bales by a rope guiding arm in a round bale press which has a chamber and presses the bales while rotating them, the method comprising the steps of automatically advancing the rope guiding arm from a rest position into a starting position before termination of the pressing step; inserting an initial portion of the rope into the pressure chamber of the press during said advancing step for engagement by and anchoring in the bale, said advancing step including arresting the rope guiding arm in front of a receiving opening of the bale press and in a substantially central region thereof, and further advancing the same after the rope is engaged by the bale and the bale applys a predetermined back-pressure, said advancing step being performed in response to sensing of said pressure; thereafter returning the rope guiding arm back to said rest position thereof over a period of time which is longer than the time required for performing said advancing step so that the rope is withdrawn from said arm by the rotating bale and becomes convoluted about the same, said returning step including helically convoluting the rope about the bale between the end regions of the bale several times at one place and between the end regions of the bale; and severing the rope when or shortly before the rope guiding arm reaches the rest position.

4,182,236

VERTICAL BALER WITH IMPROVED MATERIAL HOLD-DOWN AND BALE EJECTING MEANS

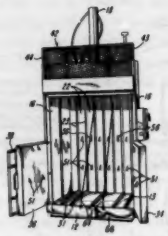
Charles H. Greer, Urbana, Ohio, assignor to Piqua Engineering, Inc., Piqua, Ohio

Filed Nov. 30, 1978, Ser. No. 965,182

Int. Cl.[2] B65B *13/06;* **B30B** *15/32*

U.S. Cl. 100—8 **9 Claims**

1. In a baler including means defining a compacting chamber adapted to receive scrap material, a platen disposed within the chamber, power operated means for moving the platen between a retracted position and an extended position to provide for adding material to the chamber and to effect pressing of the material into a bale, means providing for trying a compacted bale with a flexible tie member, at least one material hold-down member supported for movement between an extended position for engaging the material within the chamber and a retracted position to permit ejecting of the bale from the chamber, and an ejecting member adapted to be connected to the platen for ejecting the bale from the chamber in response to movement of the platen towards its retracted position, the improvement comprising means connecting the hold-down member and the ejecting member and effective to assure movement of the hold-down member to its retracted position prior to connecting the ejecting member to the platen.



4,182,237

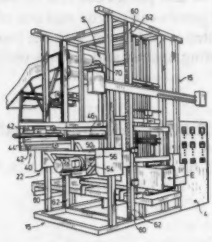
METHOD AND APPARATUS FOR STACKING BATTS IN COMPRESSIBLE COLUMNS

Theodore E. O'Brien, Sarnia, Canada, assignor to Candu Packing (Ontario) Limited, St. Thomas, Canada

Filed Dec. 18, 1978, Ser. No. 970,355

Int. Cl.[2] B30B *15/30*

U.S. Cl. 100—35 **15 Claims**



1. Method of preparing and presenting columns of aligned, resilient, batts for packaging, comprising successive cycles of operations respectively including the steps of:

disposing a platen at a reception station at the rear end of a leading column of batts; delivering batts sequentially to said station and depositing them on said platen to form thereon a succeeding column in co-axial alignment with the leading column, the delivery and deposit of each sequential batt being effected substantially in one continuous movement in one plane;

disposing the front end of the leading column in an ejection chamber having an opening through which it is entered by said column;

advancing said platen with the next succeeding column towards the ejection chamber to compress the leading column of batts within said chamber;

arresting said platen in an occluding position at the opening of said ejection chamber and maintaining it in such occluding position while the compressed batts are being expelled from said ejection chamber and, thereafter

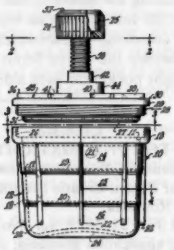
withdrawing said platen from said opening in a direction normal to the axis of the next succeeding column of batts and so re-opening the ejection chamber to receive the front end of the next succeeding column of batts which thus becomes the leading column; the next succeeding cycle of operations being initiated prior to the aforesaid withdrawal of said platen.

4,182,238

SELF CONTAINED PRESSURE VESSEL

John W. Mitchell, Sr., 1701 W. 168th St.; Kenneth H. Oyama, 1601 W. Redondo Beach Blvd., both of Gardena, Calif. 90247; John K. Lawler, deceased, late of Gardena, Calif., and by Doris G. Lawler, executrix, 16616 Taylor Ct., Gardena, Calif. 90247

Filed Jan. 23, 1978, Ser. No. 871,476
Int. Cl.[2] B30B *15/00*
U.S. Cl. 100—99 **5 Claims**



1. A pressure vessel adapted to hold gas and/or liquid and consisting of a closed-bottom, open-top container including upstanding side walls supporting an encircling top band having inner and outer faces dependent from an upper edge surrounding a wide mouth, one of the faces of said band having means for sealing engagement with the lip of a cover, the open mouth providing entry for a body of liquid adapted to fill the container to the top of said band and for removal and insertion of objects for immersed exposure to fluid pressure built up therein,

a cover formed with a recessed top and a downward extending lip having inner and outer faces, one face of which has complementary means for sealing engagement with the engagement means of said band, the cover being formed with a downwardly projecting piston chamber having a proximate closed end and a distal open end, which distal end is insertable into said body of liquid so as to approximately fill the piston chamber with liquid when the cover is mounted on said container full of liquid,

a piston disposed within said chamber, carried by a manually operable piston stem projecting outward through said closed end and cover, the closed end of the piston chamber having vent means adapted, when the piston is retracted against said closed end, to vent excess liquid forced from the container by mounting of the cover on the liquid-filled container, the recessed top of the cover forming a catch basin for receiving and holding such vented liquid, said vent means being closed by downward extension of the piston in exerting pressure of the body of thus-enclosed fluid,

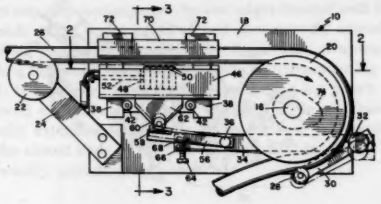
said pressure vessel additionally containing pressure relief valve means and gas inlet valve means whereby the enclosed space provided jointly by the container and mounted cover may be selectively occupied in whole or part by compressed gas introduced through said valve means.

4,182,239

CABLE AND HOSE MARKING MACHINE

Michael D. Timmins, 7712 Parma La., San Diego, Calif. 92126, and Larry L. Trepanier, 10225-166 Caminito Cyervo, San Diego, Calif. 92108

Filed Mar. 17, 1978, Ser. No. 887,673
Int. Cl.[2] B41F *17/10*
U.S. Cl. 101—11 **4 Claims**



1. A cable and hose marking machine, comprising:

a support member;

a motor mounted on said support member adjacent one end, said motor having a drive shaft with a grooved drive pulley thereon for continuous rotation;

a support pulley mounted adjacent the other end of said support member for supporting a cable or hose extending between the pulleys;

a channelled back-up guide fixed to said support member to support a portion of a cable or hose between the pulleys;

a printing head movably mounted on said support member opposed to said back-up guide, and being movable between a retracted position clear of the back-up guide and a printing position in contact with a cable or hose supported in the back-up guide;

an actuating lever pivotally mounted on said support member;

a pressure roller mounted on one end of said actuating lever for holding a cable or hose wrapped around substantially half the circumference of said drive pulley and in frictional contact therewith;

the other end of said actuating lever being coupled to said printing head; and

a cam on said drive shaft for engaging said actuating lever as the drive shaft rotates and simultaneously releasing the pressure of said pressure roller and moving said printing head into the printing position.

4,182,240

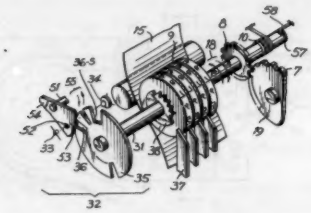
PRINTER CONTROL ASSEMBLY

Yoshihiro Mitsui, and Tadayoshi Shimodaira, both of Shiojiri, Japan, assignors to Shinshu Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1977, Ser. No. 828,685
Claims priority, application Japan, Aug. 27, 1976, 51-102496; Jan. 24, 1977, 52-6525
Int. Cl.[2] B41J *1/44*
U.S. Cl. 101—99 **12 Claims**

1. In a printer including a plurality of print rings having print characters circumferentially disposed therearound, said print characters being selectively positioned in a print position by rotation of each of said print rings in a first rotational direction from a stand-by position to a print position during a print cycle and rotational drive means including motor means adapted, in response to being energized, to rotatably drive said print rings at least from said stand-by position to said print position during each print cycle, the improvement comprising a detection means including a single detector and a single detection plate means for detecting the rotary position of said print rings, said single detector generating a character selection timing signal representative of each of the rotational positions of said print

rings, said rotational positions of said print rings corresponding to a print character circumferentially disposed about said print rings, said single detection plate means rotating in coordination with said print rings relative to said single detector, print selection means associated with each of said print rings for selectively positioning each of said print rings at respective predetermined print positions during each print cycle, in response to said character selecting timing signal produced by



said single detector being applied thereto, said single detector being further adapted to generate a reference timing signal that is distinct in wave form from said character selection signal, said reference timing signal being generated after all said print rings are at said respective predetermined positions, during each print cycle, and further comprising means for deenergizing and braking said motor means in response to said reference timing signal being generated by said single detector.

4,182,241

HAND OPERATED STAMP

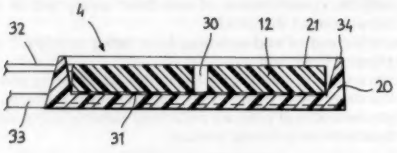
Erhard Holtorf, Rodgau, Fed. Rep. of Germany, assignor to Ferrero OHG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 31, 1978, Ser. No. 874,010

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1977, 7704672[U]

Int. Cl.[2] B41K *1/56*

U.S. Cl. 101—405 **13 Claims**



1. A hand operated stamp of the type including a molded plastic resilient printing section and a separately molded handling portion of a firmer plastic material than that of said printing section with the improvements comprising the printing section being molded in a generally flat tray shape having a printing surface on one side thereof with edges extending generally vertically therefrom in a direction away from the printing surface and around the periphery thereof to receive the handling portion in the bottom of the tray, the handling portion being in the form of a thin plate which is surrounded almost completely by the edges of the tray-shaped section.

4,182,242

BLAST HOLE LINER

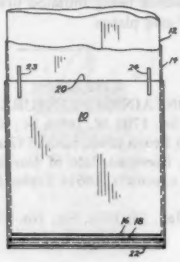
Charles R. Mesia, Mountain Iron, Minn., assignor to Mesabi Jobbers, Inc., Virginia, Minn.

Filed Jun. 10, 1977, Ser. No. 805,279

Int. Cl.[2] F42B *3/00*

U.S. Cl. 102—22 R **5 Claims**

1. A blast-hole liner comprising an elongated, flattened, flexible waterproof tube having a transversely extending waterproof seal at the bottom end thereof and being open at its upper end to receive an explosive charge, a relatively short, flexible sleeve surrounding the lower end of the tube and secured at its lower end to the lower end of the tube, the sleeve being generally open at the top thereof, and fastening means



supportively attaching the sleeve to the tube above the lower end of the latter, the tube having an explosive-receiving interior substantially coextensive downwardly with the lower end of the sleeve; whereby the sleeve forms with the tube an upwardly open weight pocket on each side of the tube.

4,182,243

PLANT FOR PNEUMATIC TRANSPORT

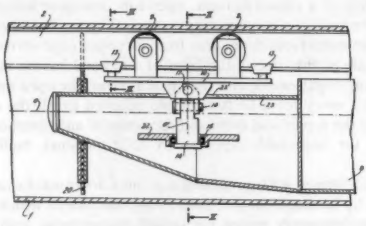
Constantin O. Ceauselu, Bucharest, Romania, assignor to Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst, Bucharest, Romania

Filed Jun. 22, 1977, Ser. No. 809,009

Claims priority, application Romania, Jul. 1, 1976, 86652

Int. Cl.[2] B61B *13/10;* **B65G** *51/08*

U.S. Cl. 104—138 R **2 Claims**



1. A pneumatic transport plant comprising:

a plurality of spaced apart pneumatic tubes in alignment and defining a transport path;

a continuous overhead rail in the form of an I-beam extending continuously along said path and through each of said tubes and mounted therein, said rail being mounted within said tubes by a plurality of respective brackets flanking said rail and spaced therealong within said tubes, said brackets being bolted to the resepective wall of said tubes and airtight therewith and engaging the underside of the upper flange of said rail, said upper flange being held between said brackets and the respective wall of said tubes;

a respective exhaust blower connected to each of said tubes proximal to a downstream end thereof;

a vehicle riding along said rail, said vehicle comprising:

an elongated container suspended beneath said rail and displaceable therealong, said container having a first axis extending in the direction of travel,

at least one vertical pivot formed at an end of said container and having a second axis intersecting said first axis,

a first horizontal pivot mounted on said vertical pivot for rotation therewith about said second axis, said first horizontal pivot having a third axis intersecting said second axis and perpendicular thereto and parallel to said first axis,

a yoke mounted on said first horizontal pivot and rotatable about said third axis and rotatable with said first horizontal pivot about said second axis,

a second horizontal pivot mounted on said yoke above said first horizontal pivot, said second horizontal pivot having a fourth axis intersecting said second axis and perpendicular to said third axis,

a support mounted on said second horizontal pivot for tilting about said fourth axis,

a plurality of support rollers mounted on said support and flanking said rail, said support rollers riding upon the lower flange thereof, said lower flange defining two support surfaces,

a plurality of first guide rollers mounted on said support, said guide rollers flanking said rail and normally spaced therefrom for engagement therewith only during lateral displacement of said container,

a plurality of second guide rollers mounted on said container in the median plane thereof and spaced from the respective wall of said tubes for engagement therewith only during lateral displacement of said container, and

packing means on said container for enabling said vehicle to be pneumatically displaced through said tubes;

at least one deck formed at an end of said container and having an opening formed therein; and

a platform mounted in said container below said deck, said platform carrying said vertical pivot and said second guide rollers, said vertical pivot extending through said opening in said deck and said second guide rollers extending through respective openings formed in the wall of said container.

4,182,244

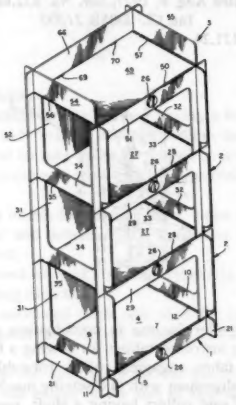
MODULAR DISPLAY DEVICE

Ferris L. Hutchins, Jr., Doraville, and James L. Gebhardt, Roswell, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 2, 1978, Ser. No. 957,296

Int. Cl.[2] A47B *7/00*; B65D *19/00*; A47B *87/00*

U.S. Cl. 108—91 **8 Claims**



1. A display device comprising a first rectangular horizontal platform (**4**), a pair of upwardly extending leg panels (**9, 10**) foldably joined respectively to the side edges of said first platform and in substantially normal relation thereto, a pair of substantially vertical open ended slits (**17,19,18,20**) formed in each leg panel of said pair of upwardly extending leg panels and respectively disposed adjacent the end edges thereof with their open ends at the upper edges of said upwardly extending leg panels, a second rectangular horizontal platform (**27**) disposed in spaced relation above said first platform, a pair of downwardly extending leg panels (**29,31**) foldably joined respectively to the front and rear edges of said second platform and in substantially normal relation thereto, a pair of substantially vertical open-ended slits (**36,37,38**) formed in each leg panel of said pair of downwardly extending leg panels and respectively disposed adjacent the end edges thereof with their open ends at the lower edges of said downwardly extending pair of leg panels, the slits (**17–20**) of said pair of upwardly extending leg panels being aligned with the corresponding slits (**36–38**) in said pair of downwardly extending leg panels and the closed ends of the slits (**17*a*,18*a*,19*a*,20*a***) in said pair of upwardly extending leg panels being in close juxtaposition with the closed ends of the slits (**38*a*,36*a*,37*a***) in said pair of downwardly extending leg panels.

4,182,245

METHOD AND APPARATUS FOR THE COMBUSTION OF CRUSHED SOLID FUELS

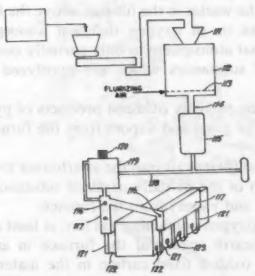
Alan G. Stewart; John Whiteford, and William J. Emmett, all of Armadale, Australia, assignors to Concrete Industries (Monier) Limited, Belmont, Australia

Continuation of Ser. No. 722,760, Sep. 13, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 887,413

Claims priority, application Australia, Sep. 17, 1975, 3207; Mar. 29, 1976, 12453

Int. Cl.[2] F23K *3/02*

U.S. Cl. 110—101 CF **6 Claims**

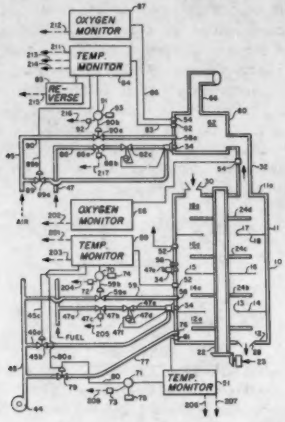


1. A method for the combustion of crushed solid fuel comprising crushing the fuel into a powder form, placing the crushed fuel into a storage bin and fluidizing said fuel within said bin, passing the fluid fuel through a de-airing pipe to partially compact the fuel, advancing the partially compacted de-aired fuel into a mixing chamber, passing a flow of constantly pulsing compressed air through the mixing chamber so as to form a vena-contracta in said mixing chamber thereby inducing the flow of partially compacted de-aired fuel into the compressed air and causing the mixture of de-aired fuel and compressed air to flow into a kiln or furnace, the combination of the pulsed air flow and the feed of the partially compacted de-aired fuel thereinto from the de-airing pipe being effective to insure regular flow of the de-aired fuel through the de-airing pipe to said mixing chamber and regular pulses of compressed air and de-aired fuel through the vena contracta to the kiln or furnace.

4,182,246
INCINERATION METHOD AND SYSTEM

Luis A. Lombana, Belmont, Calif., and Jose G. Campos, Ballston Lake, N.Y., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Jan. 16, 1978, Ser. No. 869,893
Int. Cl.[2] F23G 5/00
U.S. Cl. 110—188 20 Claims



1. A process for treating organic materials containing fixed carbon in a multiple hearth furnace having a plurality of superposed hearth spaces and an afterburner or the like mounted to receive gases and vapors from the furnace, said process comprising the following steps:

a. introducing the materials into the multiple hearth furnace and moving the same downwardly from hearth to hearth therethrough by rabbling;

b. pyrolyzing the wastes in the furnace above the lowermost hearth spaces in an oxygen deficient atmosphere and regulating that atmosphere to only partially complete the oxidation of substances which are pyrolyzed from the wastes;

c. conveying the partially oxidized products of pyrolysis in the medium of gases and vapors from the furnace to the afterburner;

d. introducing sufficient air into the afterburner to complete the oxidation of the partially oxidized substances carried by the gases and vapors from the furnace;

e. introducing oxygen-containing gas into at least one of the lowermost hearth spaces of the furnace in an amount sufficient to oxidize fixed carbon in the material in the lowermost hearth space to generate heat which rises to the upper hearths; and,

f. discharging treated organic material from the lowermost hearth space.

4,182,247
METHOD AND APPARATUS FOR CROP TRANSPLANTING

Gene B. Talbott, Box 173-D, Rte. 1, Banks, Oreg. 97106

Filed Sep. 12, 1977, Ser. No. 832,686
Int. Cl.[2] A01C 11/02
U.S. Cl. 111—3 4 Claims

1. Apparatus for use in crop transplanting comprising:

a vehicular frame;

carriage means mounted on said frame selectively operable for reciprocal shifting relative to the lenghthwise dimension of said frame;

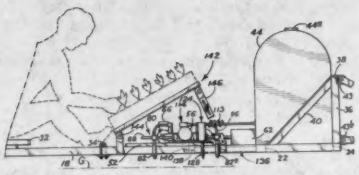
carriage return means mounted on said frame operable for selectively shifting said carriage means in a forward direction;

plural fluid dispensing means mounted on said carriage means, each including a nozzle substantially vertically mounted and selectively operable for injecting a fluid jet into the ground for forming a crop receiving cavity which extends beneath the ground surface; and

reservoir means mounted on said carriage means for storing fluid under pressure;

a fluid supply source mounted on said frame including pump means operable for delivering fluid to said reservoir means;

impeding means mounting on said carriage means operable for selectively maintaining said carriage means substantially immobile relative to the ground during travel of said frame thereover;



first valve means mounted on said frame operable for selectively metering fluid from said reservoir means to said fluid dispensing means;

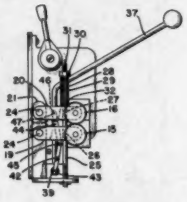
second valve means mounted on said frame operable for selectively metering fluid from said fluid supply source to said impeding means; and

control means interconnected to said first and second valve means, said control means being operable for actuating said first valve means to selectively meter fluid from said reservoir means to said fluid dispensing means and also being operable for actuating said second valve means to selectively meter fluid from said supply source to said impeding means and said carriage return means.

4,182,248
FABRIC PULLER

Arthur C. Klages, 1907 Huntington Rd., Greensboro, N.C. 27408

Filed Aug. 8, 1977, Ser. No. 822,688
Int. Cl.[2] D05B 21/00
U.S. Cl. 112—121.26 1 Claim



1. A fabric puller for use in combination with a sewing machine having instrumentalities for sewing a fabric comprising; a pair of fabric-engaging rollers rotatably mounted in biased parallel alignment with said sewing machine instrumentalities, each of said rollers having a shaft, means for urging said rollers toward each other to engage and apply a pulling force on said fabric, said urging means including a stanchion, a pair of vertically spaced apart roller shaft supporting brackets, each of said brackets being pivotably mounted in a cantilever manner to said stanchion, intermeshing cooperating gear means connected to said supporting brackets, resilient means

urging said brackets to pivot toward each other to engage and apply tension to said fabric as said fabric is pulled from said sewing instrumentalities of said sewing machine by the rotation of a rotating crank-operated toggle means connected to one of said brackets, means for separating said fabric-engaging rollers from engagement with the fabric positioned therebetween, means for driving each of said roller shafts at predetermined speeds, and a coupling means for each roller shaft connecting said roller shaft to its driving means and supporting and resiliently urging said fabric-engaging rollers into parallel alignment when separated, said coupling means including, for each shaft, a cylindrical helical member for connecting said shaft to the shaft driving means, said driving means including a variable speed gear reducing mechanism whereby the rotation of each of said fabric engaging rollers will rotate at a predetermined angular velocity to control the linear travel of the fabric through the sewing machine instrumentalities.

4,182,249

AUTOMATIC BUTTONHOLE APPARATUS FOR USE WITH SEWING MACHINE

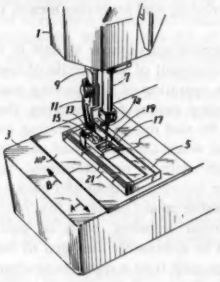
Nobuyoshi Matumura, Yao, and Kotohiko Tukioka, Kobe, both of Japan, assignors to Maruzen Sewing Machine Co., Ltd., Moriguchi, Japan

Filed May 24, 1978, Ser. No. 908,911

Claims priority, application Japan, Jun. 13, 1977, 52/70276; Nov. 29, 1977, 52/144353

Int. Cl.[2] D05B *3/06, 3/02*

U.S. Cl. 112—158 B **16 Claims**



1. In combination,

a sewing machine having a frame having a bed,

buttonhole stitch forming instrumentalities including a needle mounted on said frame for endwise reciprocation and sidewise movements transversely of the direction of reciprocation,

work feeding means for moving work under the needle,

a presser bar and presser foot for holding work on said machine bed,

a shoe mounted on said foot and relatively slideable in a work feeding direction,

first means associated with said shoe for generating first electric signals each related to the extent of movement of the shoe,

second means for generating second electric signals each related to the extent of the size of the buttonhole to be stitched,

third means responsive to said first and second means for comparing the first and second electric signals,

and, means responsive to said comparing means for acting on said buttonhole stitch forming instrumentalities when said first and second electric signals coincide with each other.

4,182,250

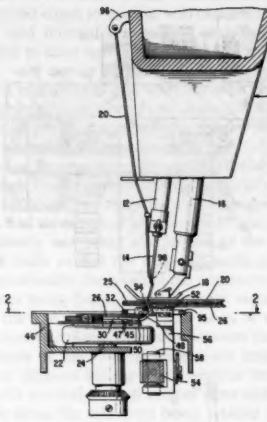
BOBBIN THREAD CONTROL MEANS FOR A LOCK STITCH SEWING MACHINE

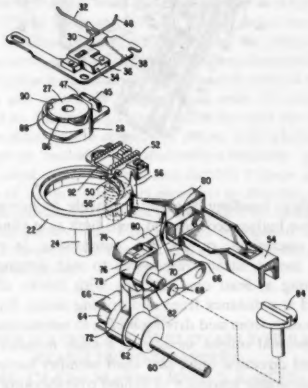
Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, New York, N.Y.

Filed Feb. 2, 1979, Ser. No. 9,026

Int. Cl.[2] D05B *57/14, 49/00*

U.S. Cl. 112—184 **5 Claims**





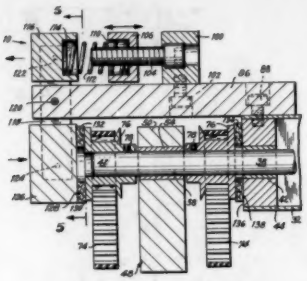
1. In a lockstitch sewing machine, mechanism for removing lengths of thread from a bobbin spool for use in the formation of stitches by a needle including fixed thread supporting means between the bobbin spool and needle, a thread engageable member mounted in the machine for movement along an arcuate path and cooperable with the supporting means for pulling thread from the bobbin spool, an angular extension on said thread engageable member, a feed dog for moving material under the needle, means for moving the feed dog according to a selected length for stitches to be formed in the material, and a member affixed to the feed dog and engageable with said angular extension as determined by the motion of the feed dog whereby the thread engageable member is caused to pull lengths of thread from the bobbin spool in accordance with the selected stitch length.

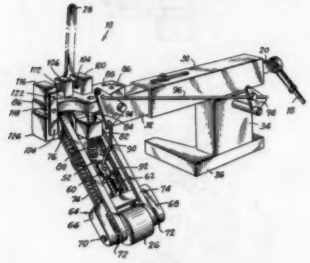
4,182,251

HIGH SPEED INDEXING SYSTEM

Charles Block, 1129 Albert Rd., North Bellmore, N.Y. 11710, and Leon Mintz, 7 Valley Rd., Syosset, N.Y. 11781

Filed Feb. 25, 1977, Ser. No. 772,061
Int. Cl.[2] D05B 27/14
U.S. Cl. 112—322 5 Claims





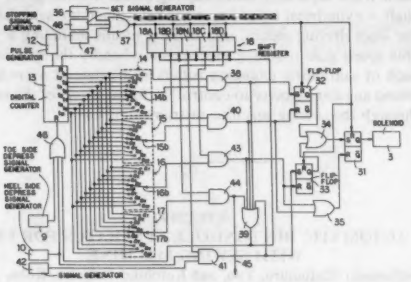
1. Fabric handling apparatus capable of moving fabric in successive high-speed indexed steps such as in connection with sewing operations, or the like, comprising, in combination: driving means, means responsive to said driving means for performing at least one function with fabric, clutch means disposed at a distance from said driving means for converting input motion from said driving means to substantially intermittent rotational output motion of a shaft member in a single rotational direction only, said shaft member having an otherwise undesirable tendency to exhibit overshooting movements due to its associated inertia load, indexing means cooperative with said clutch means for controlling the magnitude of said single-direction rotational movement of said shaft member, and adjustable brake means associated with said shaft member for retarding said undesirable inertia-caused overshooting movements of said shaft member during operation thereof, thereby facilitating relatively high-speed substantially reliable indexing of said rotating apparatus, said brake means comprising at least one friction member disposed in contact with rotating a surface associated and movable with said shaft member, spring means normally biasing said friction member against said surface, and adjustment means for selectively controlling pressure between said friction member and said surfaces, said spring means being spaced from and disposed in substantially parallel functional relationship with respect to the axis of said shaft member, forces from said spring means being transmitted to said friction member through a linkage arrangement.

4,182,252

CONTROL SYSTEM FOR A SEWING MACHINE

Satoshige Yoneji; Yoshiharu Higuchi, and Shushin Mori, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 17, 1978, Ser. No. 879,107
Claims priority, application Japan, Feb. 18, 1977, 52/17433
Int. Cl.[2] D05B 69/18, 69/20
U.S. Cl. 112—317 12 Claims



1. A control system for a sewing machine which includes a needle, work feeding means for feeding a work fabric and feed reversing means for reversing the feeding direction of the work feeding means, the reversing means including electrical means for controlling said reversing means, the control system comprising:

means for generating impulse signals in synchronism with vertical movement of said needle of said sewing machine during the operation of said sewing machine;

digital counting means for counting the impulse signals generated by said impulse generating means and generating a signal when the number of counted impulse signals corresponds with a predetermined respective impulse number for forward feeding and backward feeding;

electrical bistable means having a first output terminal and a second output terminal, each of said terminals being adapted to be alternately changed to the different stable-output state each time a stable-state-changing input signal is applied;

a first circuit connected with said electrical feed reversing means for actuating the same in response to the output signal of said digital counting means during generation of the output signal from said first output terminal of said bistable means;

a second circuit connected with said electrical feed reversing means for deactuating the same to effect the forward feed in response to the output signal of said digital counting means during generation of the output signal from said second output terminal of said bistable means;

a third circuit for providing said stable-state-changing input signal to said bistable means and providing a reset signal to said digital counting means in response to either one of output signals from said first circuit and said second circuit for making said first circuit and said second circuit alternatively and consecutively actuate and deactuate said electrical feed reversing means, boundlessly repeating; and

terminating means for terminating the repetition of the actuation and deactuation, when a desired time has been reached, of said electrical feed reversing means by said first circuit and said second circuit.

4,182,253

DRILLING VESSEL WITH HANDLING MEANS FOR DRILLING PIPE

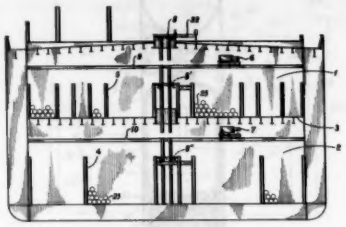
Kees Bordes, Maasland, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Continuation of Ser. No. 805,104, Jun. 9, 1977, abandoned. This application Nov. 9, 1978, Ser. No. 958,992

Claims priority, application Netherlands, Jun. 10, 1976, 7606280

Int. Cl.[2] B63B *25/00*

U.S. Cl. 114—72 **2 Claims**



1. A drilling vessel having a hold, that extends transversely thereof for substantially the entire width of said vessel, for storing drilling pipes horizontally therein with the pipes extending parallel to the length of the vessel, an elevator for moving pipes into and out of said hold, said elevator being disposed in the longitudinal center plane of the vessel and extending lengthwise of the vessel, vertically disposed guide members fore and aft of the hold for guiding the ends of the elevator vertically, an overhead crane for loading and unloading pipes on said elevator and moving pipes in said hold, said crane extending lengthwise of the vessel in the hold and supported at its ends on horizontal tracks that extend transversely of the hold for substantially the entire width of said hold and are disposed fore and aft of the hold, said horizontal tracks being interrupted at their midportions adjacent the longitudinal center plane of said vessel and the ends of said elevator being movable vertically through said interrupted midportions of said tracks.

4,182,254

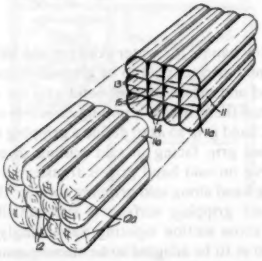
TANKS FOR THE STORAGE AND TRANSPORT OF FLUID MEDIA UNDER PRESSURE

Campbell Secord, Little Cheverells, Markyate, Hertfordshire, England

Continuation of Ser. No. 623,110, Oct. 16, 1975, abandoned. This application Nov. 23, 1977, Ser. No. 854,279

Int. Cl.[2] B63B *25/08;* B65D *7/38*

U.S. Cl. 114—74 A **12 Claims**



1. An internal-pressure-sustaining insulatable tank of generally rectangular cross-section for the storage and transport of fluid media under pressure, comprising a bottom wall, a top wall, two opposite longitudinal side walls and two opposite end walls, an internal framework of plates, bottom supports and top supports; each of said bottom, top and side walls consisting of a multiplicity of equal-sized parallel lobes, each lobe of part-cylindrical form having an arc in the range 50° to 90° and being convex outwardly of the tank with each of its two inwardly-directed longitudinal edges joined to both a longitudinal edge of a lobe alongside and an edge of a plate of said internal framework; each of said end walls consisting of a multiplicity of equal-sized convex end wall elements having the same radius of curvature as said lobes and each joined at its inwardly directed edges to the end wall elements alongside and to plates of said internal framework; tank corner elements being provided to unite said bottom, top, side and end walls to one another, said corner elements being convex and of the same radius of curvature as said lobes but with larger arcs; said internal framework consisting of two orthogonally intersecting series of parallel plates, each plate in one series extending from the joint between two lobes of one side wall to the respective opposite joint of the opposite side wall, each plate in the other series extending from the joint between two lobes of the bottom wall to the respective opposite joint between two lobes of the top wall, and the plates of at least one of said series extending longitudinally and being also united to the joints of the opposite end walls so that the tank end walls are tied to one another longitudinally; the joints at the intersections of the two series of plates being formed by cruciform section insert elements with the end edges of the four arms of the cruciform welded to respective plates, the joints between the bottom wall lobes and plates of the internal framework being formed by bottom insert elements having a crosssection that is generally cruciform with vertical top and bottom arms and downwardly drooped side arms, the side arms being welded to the respective bottom wall lobes and the top arms being welded to the respective internal plates, the joints between the side wall lobes and the plates of the internal framework being formed by Y-section insert elements with the arms thereof welded to the respective side wall lobes and internal plates, and at least some of the joints between the top wall lobes and the plates of the internal framework being formed by top insert elements having a cross section that is generally cruciform with vertical top and bottom arms and upwardly inclined side arms, the side arms being welded to the respective top wall lobes and the bottom arms being welded to the respective plates; and wherein said bottom supports include longitudinally-extending grooves which are located under the tank and slidably engage with the bottom arms of the bottom insert elements to thereby support and permit longitudinal expansion of the tank with space below the lowermost parts of the bottom wall lobes, and said top supports are located above the tank and engage the top arms of the top insert elements.

4,182,255

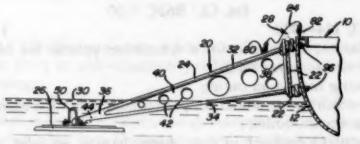
BELOW WATERLINE DEPLOYABLE HULL STABILIZING MEMBERS

Bruce D. Reid, 124 Pine St., Toms River, N.J. 08753

Filed Feb. 22, 1978, Ser. No. 880,327

Int. Cl.[2] B63B *39/06, 43/04*

U.S. Cl. 114—126 **7 Claims**



1. In combination with a boat hull including opposite sides and a predetermined waterline at rest, selectively deployable hull stabilizing structure for stabilizing the hull when at rest, said stabilizing structure including an elongated upstanding mount, support means supporting vertically spaced opposite

end portions of said mount from the exterior of one of said sides and for independent adjustable spacing of said end portions outwardly of said one side, said mount defining a first vertically elongated guide and support member, an elongated generally horizontal boom having base and free end, said base end of said boom including a second vertically elongated guide and support member, said first and second guide and support members including coacting removably guidingly engageable portions engageable with each other upon downward movement of said second support member relative to said first support member for stationary support of said second support member relative to said first support member with said boom projecting outward from said one side of said hull, and a generally horizontal panel structure supported from the free end of said boom at a level below said waterline.

4,182,256

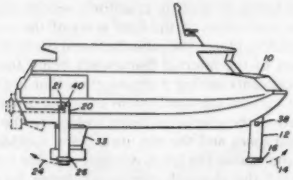
AUTOMATIC TAKEOFF CONTROLLER FOR HYDROFOIL CRAFT

John H. Scott, Issaquah, and Arlyn O. Harang, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 15, 1973, Ser. No. 388,429

Int. Cl.[2] B63B *1/18, 1/22*

U.S. Cl. 114—282 **4 Claims**



1. In a control system for a hydrofoil craft having forward and aft foils, the combination of control surface means on the forward foil, control surface means on the aft foil, power plant throttle means for said craft, means connected to said throttle means and operable while said craft is hull-borne with said throttle means at its minimum speed setting for producing an electrical signal indicative of said hull-borne condition, servo systems for the forward and aft control surface means, means including a relay device responsive to said electrical signal for actuating said servo systems to position said control surface means prior to and during takeoff to facilitate rapid takeoff from hull-borne to foil-borne operation with minimum drag, and apparatus including a height sensor for disabling said last-named means when the craft reaches a predetermined foil-borne height.

4,182,257

RESCUE EQUIPMENT FOR SUBMARINE CRAFTS

Eckhard Rolf, Bremen, Fed. Rep. of Germany, assignor to Erno Raumfahrttechnik GmbH, Bremen, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 917,080

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727720

Int. Cl.[2] B63C *7/00*

U.S. Cl. 114—333 **1 Claim**

1. Rescue equipment for a submarine vehicle for blowing ballast tanks, comprising:

a casing having an outlet;

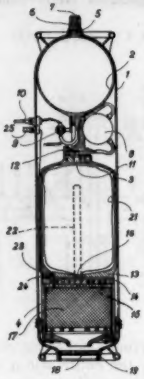
a first storage container for pressurized gas in the casing and having an outlet;

a second container in the casing, having an inlet and an outlet;

valve controlled conduit means interconnecting the outlet of the gas container with the inlet of the second container;

a flexible bag in the second container and containing a liquid reactant and being connected to the discharge outlet of the second container, the first container discharging gas into space between the second container and the bag upon opening of the conduit means, thereby forcing the liquid out of the bag;

a gas generator connected between the discharge outlet of the second container and the outlet of the casing to discharge generated gas based on chemical reaction or catalytic decompositioning of the liquid reactant in the bag; and



second valve controlled conduit means communicating with the space between the bag and the second container to discharge therefrom pressurized gas having entered the second container after discharge from said first container.

4,182,258

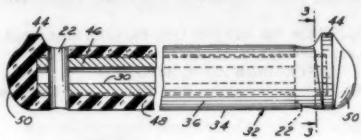
WATER SKI TOW HANDLE

Dwight W. Presser, 3148 Middlebelt, W. Bloomfield Township, Huron County, Mich. 48033

Continuation of Ser. No. 835,912, Sep. 23, 1977, abandoned. This application Dec. 15, 1978, Ser. No. 969,876

Int. Cl.[2] A63C *11/10*

U.S. Cl. 115—6.1 **13 Claims**



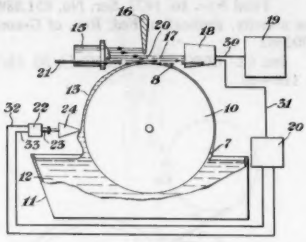
1. In a tow handle for water skiing or the like comprising an elongate hand grip adapted to be gripped encompassingly by a skier's hand and means on said hand grip for attaching a tow line to extend therefrom in a pulling direction transverse to the axis of said hand grip so as to define a gripping surface on a side of said hand grip facing in said pulling direction such that pulling force on said hand grip is transferred to a skier's encompassing hand along said gripping surface, the improvement wherein said gripping surface is substantially V-shaped in transverse cross section tapering narrowingly in said pulling direction so as to be adapted to be encompassingly gripped by a skier's hand with first and second finger phalanges extending along respective sides of said V-shaped gripping surface such that said pulling force is distributed over said gripping surface and substantially uniformly transferred to finger phalanges of a skier's hand.

4,182,259

APPARATUS FOR MEASURING COATING THICKNESS ON AN APPLICATOR ROLL

Joseph L. Garner, Sanford, and Edwin L. Wittbrodt, Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 4, 1978, Ser. No. 948,468
Int. Cl.[2] B05C *1/08, 11/10;* H01J *39/12;* G01N *21/28*
U.S. Cl. 118—712 15 Claims



1. In a coating apparatus, means for measuring the amount of coating material on an applicator roll, comprising:

a. an applicator roll associated with a source of said material;

b. shield means spaced from the roll surface;

c. a light source capable of emitting a beam of light in a direction which is not parallel to the axis of the cylindrical surface, said light source being positioned such that when the coating material is deposited on the cylindrical surface, a first portion of the light emitted therefrom is intercepted by the coating material deposited on the cylindrical surface and a second portion passes across an arc of the coated cylindrical surface, said shield being aligned such that a first part of the second portion of light is intercepted thereby and a second part of the second portion of light passes through the aperture formed by said shield and roll surface; and

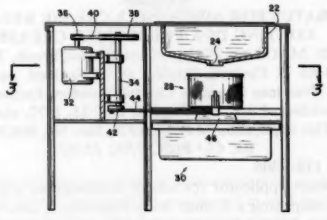
d. a detector means capable of measuring at least a fraction of the amount of said second part of light, the amount of said fraction varying with the thickness of the coating material when same is deposited on the cylindrical surface.

4,182,260

HAND BREADER

Vernon E. Reece, 1936 W. 47th Pl., Tulsa, Okla. 74125

Filed Jan. 9, 1978, Ser. No. 867,756
Int. Cl.[2] B05C *3/02*
U.S. Cl. 118—26 4 Claims



1. A breading apparatus comprising:

a table structure;

an open top breading pan supported on said table, the breading pan being open at the top and having a central closable opening in the bottom thereof, the breading pan being adaptable to receive flour or like material wherein pieces of food, such as pieces of chicken, may be placed in the flour and covered with the flour by manual manipulation of the process in the flour;

a removable catch pan supported by the table below said breading pan;

and a sifting apparatus supported by the said table structure between said breading pan and said catch pan comprising:

an upright reciprocal basket holder supported by said table and rotatable about a vertical axis in substantial vertical alignment with said bottom opening in said breading pan;

a motor supported by said table structure;

a crank arm rotated by said motor;

means connecting said crank arm to said reciprocal basket holder whereby when the motor is energized the basket holder is reciprocated about its vertical axis;

an open top cylindrical sifter having foraminous vertical sidewalls substantially perpendicular to a removable flat foraminous bottom;

said sidewalls formed of continuous foraminous material; the sidewalls having a reduced diameter interior flange therein, the flange receiving and supporting said foraminous bottom; the bottom being a circular flat plate of an exterior diameter substantially equal to the interior diameter of the cylindrical vessel and of diameter larger than the internal diameter of said interior flange;

a molded elastomeric member encompassing the outer circumferential area of the bottom plate, the outside diameter of the elastomeric member being of a dimension to be slidably received in said vessel cylindrical sidewalls; said outside diameter having an outer circumferential contact portion to provide a snug fit between said sidewalls and said bottom;

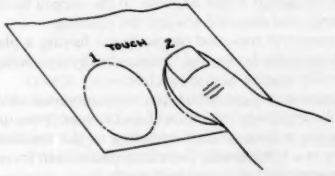
said sifter being removably supported on said basket holder and reciprocated about its cylindrical axis by said basket holder whereby flour or the like discharged from said breading pan falls into said sifter and the sifted flour falls from said sifter into said catch pan.

4,182,261

CREDIT CARD PRINTER FOR FINGERPRINTS AND SOLUTIONS

Jay Smith, III, Pacific Palisades, and Virgle Hedgcoth, Santa Monica, both of Calif., assignors to Identicator Corporation, San Bruno, Calif.

Continuation-in-part of Ser. No. 642,165, Dec. 18, 1975, Pat. No. 4,029,012. This application May 5, 1977, Ser. No. 793,946
Int. Cl.[2] A61B *5/10;* C09D *11/02*
U.S. Cl. 118—31.5 10 Claims



1. In a printing apparatus wherein indicia is deposited on a medium from an individualized credit card, the improvement comprising;

first means for applying a quantity of a first liquid developer solution to the medium, the developer solution as applied maintaining for a limited time period sufficient film thickness on the porous medium to contact and adhere to substantially only the ridge pattern of a finger when the finger is applied to the coated medium;

second means for applying a quantity of a second liquid reagent solution to the medium, the second liquid reagent having a greater penetration rate to effectively penetrate into the medium while the first liquid developer solution is

still available on the medium surface, the first liquid developer solution and second liquid reagent solution capable of chemically interacting in the medium when intermixed to provide a permanent perceivable colorant product representative of a fingerprint ridge pattern in the medium while substantially not leaving any staining colorant product on the finger, whereby a finger can be first applied to the liquid developer coating on the medium to coat substantially only the fingerprint ridge pattern and then subsequently applied to the liquid reagent on the medium to provide a colorant product representative of the fingerprint ridge pattern and,

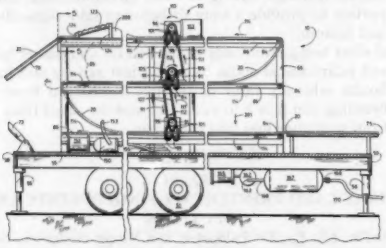
means for recording the individual indicia from the credit card so that it is operatively associated with a porous medium such as a credit card receipt including means for operatively activating the first and second means to apply the first developer solution and second liquid reagent solution to the credit card receipt.

4,182,262

APPARATUS FOR IMPREGNATING A TUBE

Benjamin A. Everson, and Kenneth D. Klotzbier, both of Fresno, Calif., assignors to Underground Surveys Corporation, Fresno, Calif.

Filed Jul. 5, 1978, Ser. No. 922,084
Int. Cl.[2] B05C *7/04, 13/00*
U.S. Cl. 118—44 **4 Claims**



1. A vehicle mounted apparatus for impregnating with a subsequently hardened fluid material an evertible tube taken from a supply thereof for lining a passageway through an opening therein; the tube having opposite ends, a fluid impermeable outer lamina, and an absorbent inner lamina which is impregnated with the material, the apparatus comprising

A. an elongated frame adjacent to the supply having a discharge end disposed toward the opening;

B. a conveyor mounted on the frame having a plurality of substantially horizontal, longitudinally extending, elevationally spaced, planar reaches;

C. a transversely extending first roller mounted on the frame at the discharge end thereof and spaced from one of the reaches a distance corresponding to the thickness of the tube in a substantially flattened condition to form a throat between the roller and said reach;

D. a plurality of secondary rollers mounted on the frame extending substantially parallel to the first roller oppositely of the discharge end in successively spaced relation from said reach and the discharge end;

E. powered means for driving adjacent reaches in opposite directions with said throat defining reach moving toward the discharge end of the frame for transporting the tube endwardly along a zig-zag path extending toward and through the throat so that the rollers flatten the tube; and

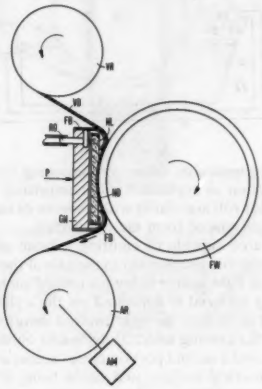
F. means disposed adjacent to the secondary rollers oppositely from the first roller for inserting a quantity of the material within the leading end of the tube prior to passage thereof through the throat so that such passage urges the material to flow from side to side within the tube and to be extruded along the tube away from said leading end thoroughly to impregnate the absorbent lamina.

4,182,263

DEVICE FOR FEEDING FUSER OIL TO THE SURFACE OF A FIXING ROLLER

Helmut Naeser, and Norbert Mendisch, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 16, 1977, Ser. No. 851,889
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1977, 2703382
Int. Cl.[2] B05C *11/00;* **G03G** *13/20, 15/20*
U.S. Cl. 118—60 **10 Claims**



1. In a device for feeding fuser oil to the surface of a fixing roller in a toner image fixing station of an electrostatic device where fuser oil is transferred to a surface of the fixing roller through the intermediary of a wick, the improvement of a first wick adjacent to the surface of the fixing roller, a chamber defining member supplying fuser oil to the side of the first wick opposite to the fixing roller, a movable second wick interposed between the first wick and the surface of the fixing roller, the first wick effective to supply fuser oil to the second wick, the second wick effective to supply fuser oil to the surface of said fixing roller, and means moving said second wick past the first wick and surface of said fixing roller in contact with said surface.

4,182,264

APPARATUS FOR APPLYING A CREASE RETAINING COATING IN A PREFORMED CREASE

James D. M. Gibson, Ilkley; Kenneth Houlbrook, Dewsbury, and John P. Coulter, Shipley, all of England, assignors to I.W.S. Nominee Company Limited, London, England

Continuation of Ser. No. 841,671, Oct. 13, 1977, abandoned. This application May 17, 1978, Ser. No. 906,973
Int. Cl.[2] B05C *5/00, 13/02*
U.S. Cl. 118—306 **8 Claims**

1. A fluid applicator for use in combination with a guide device comprising a syringe body reservoir; a nozzle for said reservoir; a fishtail end for said nozzle, a discharge slot in said end; a piston in said reservoir for forcing a fluid crease setting composition through said slot, and including a threaded piston rod; an externally toothed gear wheel operatively associated with and mounted on said threads; a drive worm supported by said body and engaging said gear wheel; a rotatable member connected to said drive worm and including spaced roller flanges and spaced rubber surfaces between and adjacent said flanges; a said guide device comprising an elongated structure

adapted to accommodate a textile article having a preformed crease and said structure profiled to position said crease wherein to receive said fluid crease setting composition; said applicator being adapted to be mounted on said guide device with said roller flanges straddling said device whereby said applicator is guided during movement along said device, said rubber surfaces in contact with said positioned textile and said

discharge slot disposed in operative association with said positioned crease; whereby an imparting motion to said fluid applicator to traverse along the elongated guide, rotary motion is transmitted to the worm which translates motion to the piston through said gear and piston rod, to effect said discharge of the fluid crease setting composition into the length of said preformed crease.

4,182,265

WAFER SUPPORT

Bernhard Bracher, Balzers, Liechtenstein, assignor to Balzers Aktiengesellschaft für Hochvakuumtechnik und Dunne Schichten, Liechtenstein

Filed Mar. 14, 1978, Ser. No. 886,353

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1977, 7707767

Int. Cl.[2] B05C *13/02*

U.S. Cl. 118—500 **8 Claims**

1. A wafer support, comprising, a baseplate with an aperture therein, a holding ring rotatably positioned in said aperture, a platform in said holding ring for supporting a wafer, said holding ring including at least one slot extending parallel to said platform and spaced therefrom, at least one retaining rod connected to said baseplate extending into said slot and engageable over the wafer on said support platform, and a portion of said holding ring adjacent said slot defining a retaining rod abutment for urging said retaining rod out of said slot and out of engagement with the wafer when said holding ring is rotated in said base.

4,182,266

MEANS FOR THE PRODUCTION OF LITHOGRAPHIC PRINTING PLATES

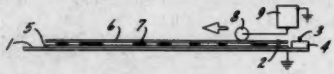
Julia M. Alston, Myrtle Bank, Australia, assignor to Research Laboratories of Australia Pty. Limited, Australia

Filed May 23, 1977, Ser. No. 799,512

Claims priority, application Australia, Jul. 21, 1976, PC6708

Int. Cl.[2] G03G *13/16*

U.S. Cl. 118—621 **7 Claims**



1. Means for producing lithographic printing plates by image transfer from either a right way reading recording member or a wrong way reading recording member, as by first transferring an image from the recording member to a transfer receiving member and then subsequently transferring the image from the transfer receiving member to an offset member, which means comprise:

(a) a conductive base having register means and ancillary register means thereon, the first said register means being arranged and positioned to engage and locate the image receiving member and the recording member on said base and the said ancillary register means being arranged and positioned to engage and locate the offset member on said base, the first said register means and said ancillary register means being spaced apart to allow access to the first said register means while said offset member is engaged on said ancillary register means,

(b) a roller having at least a conductive core arranged to move over said base outwards from said register means and return in the opposite direction toward said register means,

(c) means to apply an electrical field between said roller and said base, and

(d) means to change the polarity of said electrical field whereby the said field has one polarity in relation to the said roller on its outward movement and an opposite polarity on its return movement, said polarities being selected to prevent electrostatic image transfer while said members are pressed into intimate contact during the outward movement of the said roller and to cause electrostatic image transfer during the return movement of the said roller.

4,182,267

APPARATUS FOR KEEPING AQUATIC ANIMALS ALIVE OVER LONG PERIOD OF TIME

Naoya Kominami; Hirokazu Fukumi; Naokuni Yamawaki; Junji Nomura, and Hiroshi Kayamori, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 3, 1977, Ser. No. 803,339

Claims priority, application Japan, Jul. 20, 1976, 51-86361

Int. Cl.[2] A01K *63/00*

U.S. Cl. 119—3 **13 Claims**

1. An apparatus for keeping aquatic animals alive over a long period of time comprising:

(A) a water tank for containing aquatic animals and environmental water;

(B) a control path for containing a portion of said environmental water, said control path being located outside said water tank;

(C) a withdraw pipe line connected at an end thereof to a bottom portion of said water tank and also connected at the other end thereof to an inlet portion of said control path;

(D) a return pipe line connected at an end thereof to said

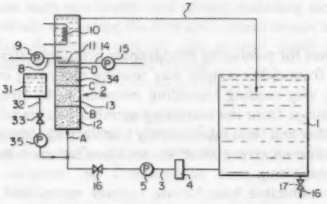
water tank and also connected at the other end thereof to an outlet portion of said control path;

(E) means for controlling the temperature of said environmental water in said control path so that it is maintained at a level as low as it is possible for the aquatic animals to exist, said temperature control means being disposed in said control path;

(F) means for bringing said environmental water in said control path into contact with air;

(G) means for eliminating ammonia compounds from said environmental water, said eliminating means being located in said control path;

(H) means for eliminating water-soluble organic compounds



from said environmental water, said eliminating means being located in said control path;

(I) a pump for recycling said environmental water through said water tank, said withdraw pipe line, said control path and said return pipe line;

(J) a supply source of an oxidizing agent connected to said withdraw pipe line at a location upstream from said ammonia compounds eliminating means and said water-soluble organic compounds eliminating means; and

(K) means for converting said oxidizing agent into a substance which is non-toxic to said aquatic animals, contained in said control path and located downstream from said ammonia compounds eliminating means and said water-soluble organic compounds eliminating means.

4,182,268

BREEDING OF AQUATIC ANIMALS IN A CONTROLLED ENVIRONMENT

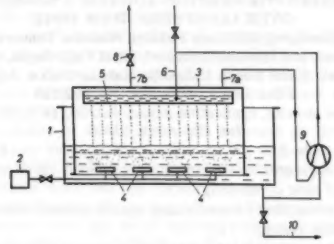
Michael Berger, Pullach, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,599

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638489

Int. Cl.[2] **A01K** *63/00*

U.S. Cl. 119—3 **13 Claims**



6. Apparatus for breeding aquatic animals, comprising a water reservoir, a gas supply means **(2, 12)**, at least one bell **(3, 13)** for being immersed partially in the water of the water reservoir **(1, 11)**; a gas distribution system **(4, 14)** disposed within the confines of the bell **(3, 13)**, said gas distribution system being in communication with said gas supply means **(2, 12)**; a liquid distribution system **(5, 15)** mounted underneath the lid of the bell **(3, 13)**, said liquid distribution system being in communication with a water feed means **(6, 16)**, said water feed means further comprising water recycle means; and at least one gas discharge pipe **(7, 17)** is arranged on the lid of the bell **(3, 13)**.

4,182,269

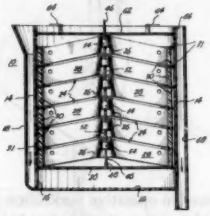
INCUBATOR FOR SALMONID EGGS AND ALEVIN

Dale E. Young, II, Rte. 4, Box 4915-1, Juneau, Ak. 99803

Filed Jan. 30, 1978, Ser. No. 873,204

Int. Cl.[2] **A01K** *61/00*

U.S. Cl. 119—3 **14 Claims**



12. An incubator for salmonid eggs and alevin, comprising:

a vessel provided with an upwelling flow of water;

a stack of foraminous bottom incubator trays within said vessel;

each tray having a hollow hub centrally located and forming a passage from beneath to above each tray, the hubs in said stack being spaced apart;

means forming an incubation substrate on each said tray above its foraminous bottom and beneath the upper extremity of said central passage; and

gate means in each passage operable to permit upward volitional migration of fry from beneath said trays.

4,182,270

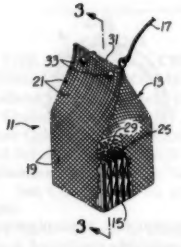
ABALONE HABITAT

Frederick J. Fourcher, 614 Orchid, Corona Del Mar, Calif. 92625

Filed Feb. 24, 1978, Ser. No. 881,017

Int. Cl.[2] **A01K** *61/00*

U.S. Cl. 119—4 **11 Claims**



1. An abalone habitat comprising:

a container having an interior and aperture means for allowing water to enter the interior of the container;

said container having an opening for providing access to the interior of the container and means for opening and closing said opening;

a plurality of non-circumscribing panels in said container to which the abalone can attach, said panels being removable

from the interior of the container through said opening when the latter is open;

each of said panels having a peripheral edge, at least some of the peripheral edges being spaced from the container to define a space within the interior of the container in which food for the abalone can be placed;

spacer means for spacing at least regions of the panels from each other whereby the abalone can attach to such spaced regions of the panels and the food can move from said space to said spaced regions; and

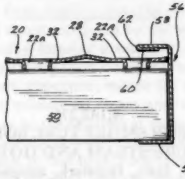
said panels and said container being resistant to sea water corrosion.

4,182,271

SELF CLEANING ANIMAL FLOOR ASSEMBLY

Gordon L. Dodge, Ankeny; Lewis D. Comstock, Oskaloosa; David J. Richards, Cedar, and Donald L. Brackett, Oskaloosa, all of Iowa, assignors to Mahaska Industries, Inc., Oskaloosa, Iowa

Filed Sep. 22, 1977, Ser. No. 835,504
Int. Cl.[2] A01K *1/00*; E04C *2/42*
U.S. Cl. 119—28 **9 Claims**



1. A self cleaning animal floor assembly comprising:

a sheet metal floor member having a plurality of elongated slots therein positioned in side by side relation;

said floor member having elongated ridges formed therein between said slots and extending in the same direction as said slots, said ridges in cross-section having an apex and downwardly sloping surfaces extending in opposite directions from said apex towards said slots;

said flooring member having elongated flat surfaces located between said downwardly sloping surfaces and said slots, the width of said flat surfaces being chosen sufficiently narrow that said animals feet will continue moving across said flat surfaces to said slots once said feet have started sliding down said sloped surfaces.

4,182,272

ANIMAL TRAINING DEVICE AND METHOD

Anthony Taff, P.O. Box 7261, Philadelphia, Pa. 19101

Filed Jan. 26, 1978, Ser. No. 872,574
Int. Cl.[2] A01K *27/00*
U.S. Cl. 119—29 **5 Claims**

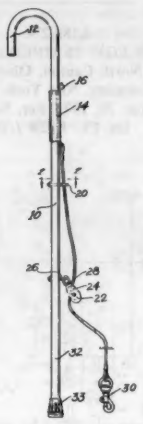
1. An animal training device comprising, in combination,

(a) an elongated staff,

(b) an elongated leash,

(c) extensible spring tensioning means mounted on said staff and connecting said leash thereto,

(d) guide means mounted on said staff below said extensible spring tensioning means through which the free end of said leash is led, said leash being extensible and retractable through said guide means under the tension of said extensible spring tensioning means, said guide means comprising a ring member mounted on said shaft and spaced below the maximum normal extension of said spring tensioning means and a pulley member mounted on the lower portion of the staff but spaced from the lower end thereof, and



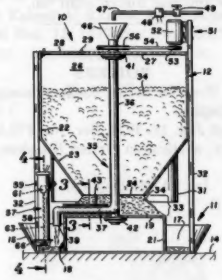
(e) means for attaching the upper end of the staff to a fixed object.

4,182,273

FEEDING APPARATUS

Maurice L. Peterson, Kerkhoven, Minn. 56252

Filed Feb. 23, 1978, Ser. No. 880,388
Int. Cl.[2] A01K *5/02*
U.S. Cl. 119—51.5 **16 Claims**



1. A feeding apparatus comprising: a feeding trough, a hopper having a chamber for accommodating dry feed material, said hopper having a bottom portion provided with a feed material discharge opening for directing dry feed material to the feeding trough, means supporting the hopper above the trough, an upright member located in the chamber, said upright member having an upright passage, said passage having an upper section and a lower section, a lateral extension connected to the member, and extended from the member to the adjacent feeding trough, said lateral extension having a lateral passage open at one end to the lower section of the upright passage, and open at the other end adjacent the feeding trough, means operable to direct liquid into the upper section of the upright passage, said liquid flowing through said upright passage and lateral passage into the feeding trough, means mounting the member on the hopper and trough for movement about a generally upright axis whereby the lateral extension moves with the member, drive means operable to move the member, whereby the lateral extension moves dry feed material through

the discharge opening into the feed trough and discharges liquid into the feed material in the feeding trough.

4,182,274

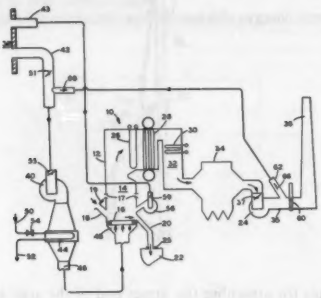
PREVENTION OF LOW TEMPERATURE CORROSION

Keith R. Williams, North Canton, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,280

Int. Cl.[2] F22B *1/00*

U.S. Cl. 122—4 R **5 Claims**



1. In combination with a steam generator, a source of air, a forced draft fan disposed in flow receiving relation with the source of air, an air heater interposed between the fan and the steam generator, a stack disposed in flow receiving relation with the steam generator, a shut-off damper interposed between the steam generator and the stack, and conduit means for returning the air from a location intermediate the steam generator and the shut-off damper to a location intermediate the source of air and said forced draft fan.

4,182,275

BOILERS

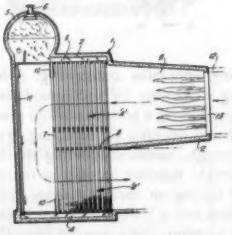
Thomas Gibson, West Yorkshire, England, assignor to E. Green & Son Ltd., England

Filed Jan. 18, 1978, Ser. No. 870,425

Claims priority, application United Kingdom, Jan. 21, 1977, 2573/77

Int. Cl.[2] F22B *1/02, 21/00*

U.S. Cl. 122—7 R **4 Claims**



1. An improved boiler comprising, in combination:

(a) an enclosed housing defined by an upper wall, a lower wall and enclosing side walls;

(b) a combustion chamber positioned at the upper wall with a gas inlet in one side wall of the housing to the chamber;

(c) a gas outlet in one side wall adjacent the lower wall, said outlet separated from the combustion chamber by a baffle wall and positioned below the combustion chamber;

(d) an upper header at the upper wall having a generally rectangular, flat construction and generally extending across the top wall;

(e) a lower header at the lower wall having a generally rectangular, flat construction and extending across the bottom wall;

(f) a plurality of substantially straight riser tubes extending from the lower header to the upper header, said riser tubes positioned adjacent the inlet and combustion chamber at their upper end and adjacent the outlet at the lower end, said tubes providing means for heating fluid flowing upwardly in the tubes by natural convection and for heat exchange with the flowing gas inflow through the inlet chamber of the boiler and thence through the boiler and the outlet by natural convection;

(g) a plurality of downcomer tubes adjacent the side wall of the boiler opposite from the gas inlet chamber, said downcomer tubes connecting the upper header with the lower header and circulating fluid therebetween by natural convection; and

(h) a steam drum attached to the upper header adjacent the intersection of the upper and sidewalls including a steam outlet for discharge of steam.

4,182,276

ECONOMIZER FOR SMOKE TUBE BOILERS FOR HIGH PRESSURE STEAM AND HOT WATER

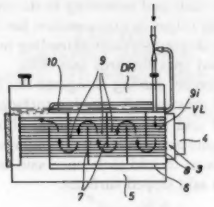
Poul L. Hededam, Hals, Denmark, assignor to Indukal ApS, Denmark

Filed Mar. 20, 1978, Ser. No. 888,424

Claims priority, application Denmark, Mar. 22, 1977, 1254/77

Int. Cl.[2] F22D *1/00*; F22B *9/08*

U.S. Cl. 122—412 **5 Claims**



1. In a boiler having smoke tubes extending through a water chamber, the smoke tubes effecting convection of water in the chamber, and an economizer for preheating water, said economizer comprising:

(a) a first jacket surrounding only a portion of the smoke tubes adjacent to their gas-discharge end;

(b) a plurality of spaced transverse baffle plates in said jacket through which said portion of said smoke tubes extends, said baffle plates defining a serpentine water channel through which all the water to be preheated can be forced in counterflow to the flue gas in said smoke tubes, said channel having a water inlet at the outlet end of said smoke tubes, and said channel discharging into said water chamber; and

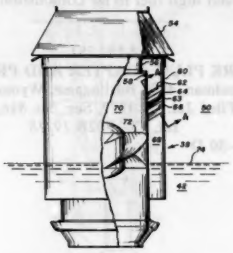
(c) a second jacket encircling said first jacket and defining a space therebetween, said space having a fluid connection with said water inlet and being part of the path through which the water flows en route to said channel.

4,182,277

STEAM SEPARATOR TO REDUCE CARRYUNDER

Charles L. Burton, Vernon, and Bard C. Teigen, Enfield, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed May 22, 1978, Ser. No. 908,432
Int. Cl.[2] F22B *37/26*; B01D *45/12*
U.S. Cl. 122—491 3 Claims



1. In a steam generator comprising a steam drum enclosing a plenum, means disposed within the plenum of the steam drum for separating steam from liquid water, the plenum for collecting liquid water and steam separated by the separation means, the liquid water thereby forming a water level in the plenum above which the separated steam occupies the plenum during operation of the steam generator, means for transferring heat to water to create a mixture of steam and water, means for delivering the mixture to the separation means, and means for returning the separated liquid water along a flow path from the separation means back to the heat-transfer means, the return means having an inlet opening into the plenum at a location below the water level therein, the improvement comprising: a bubble rake disposed within the plenum external to the separation means at a location in the flow path below the water level and near the inlet of the return means, the bubble rake having a surface that defines a channel opening generally down and in the direction of the flow path and extending longitudinally at an angle with the horizontal, the channel thereby having a high end, the buoyancy of steam entering the channel thereby causing it to be trapped in the channel and migrate to the high end of the channel, the channel forming an opening at its high end for releasing the trapped steam, whereby steam remaining in the separated water is removed therefrom and released at a higher level, the amount of steam returned to the heat-transfer means thereby being reduced.

4,182,278

COMBUSTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

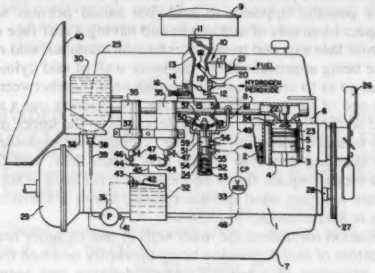
Charles A. Coakwell, 6600 N. IH 35 No. 33 Casa Norte, Loredo, Tex. 78041

Filed Aug. 29, 1977, Ser. No. 828,307
Int. Cl.[2] F02B *51/00*
U.S. Cl. 123—1 A 12 Claims

1. A process of operating a four-stroke high-compression reciprocating-piston internal combustion engine having a series of cylinders, means for supplying ambient air from outside the engine to said cylinders, means for supplying fuel to said engine to maintain the air-fuel ratio within a predetermined range, intake and exhaust valves for controlling the flow of gases to and from each cylinder, and means for igniting the air-fuel mixture in the main combustion chamber for each cylinder, said engine having a compression ratio of at least 9:1 and being designed for normal operation with low-lead gasoline with the air-fuel ratio below 17 to 1, said process being characterized by the steps of

(a) modifying the flow of air and gasoline to the engine to increase the air-fuel ratio in the main combustion chamber of each cylinder at least 10 percent to at least 18 to 1 and high enough to create ignition problems when the engine is under high load,

(b) introducing into each cylinder while the engine is under high load a solution of hydrogen peroxide to cause it to mix with the air-fuel mixture in the main combustion chamber, and



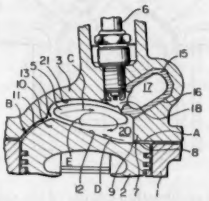
(c) regulating the flow of hydrogen peroxide to the engine cylinders in accordance with intake manifold pressure and engine load, the weight rate of flow of said hydrogen peroxide being at least 5 percent of that of the fuel and sufficient to promote effective combustion in the main combustion chamber of each cylinder during high-load operation.

4,182,279

COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Katsujiro Sato, Toyota; Kiyoshi Nakanishi, and Takeshi Okumura, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 12, 1977, Ser. No. 859,565
Claims priority, application Japan, Dec. 16, 1976, 51-167732[U]
Int. Cl.[2] F02B *23/08*
U.S. Cl. 123—30 C 15 Claims



1. An internal combustion engine compsiring:

a cylinder block having a cylinder bore therein;

a cylinder head mounted on said cylinder block and having an inner wall;

a first raised portion having on its lower end a flat bottom face and formed on the periphery of the inner wall of said cylinder head so as to project downwards;

a piston reciprocally movable in said cylinder bore and having a top face which has a flat peripheral portion approachable to said flat bottom face so as to create a first squish area therebetween at the end of the compression stroke for spouting out a first squish flow along the top face of said piston, the inner wall of said cylinder head and the top face of said piston defining a combustion chamber therebetween, said combustion chamber comprising a

main combustion chamber and an auxiliary combustion chamber which are interconnected to each other via a connection passage;

an intake valve movably mounted on said cylinder head for leading a combustible mixture into said combustion chamber;

an exhaust valve movably mounted on said cylinder head for discharging exhaust gas into the atmosphere;

a second raised portion formed on the top face of said piston at a position opposite to said first raised portion with respect to an axis of said piston and having a rear face and a front face exposed to said combustion chamber, said rear face being approachable to the inner wall of said cylinder head so as to create a second squish area therebetween at the end of the compression stroke for spouting out a second squish flow which moves forwards in the upper interior of said combustion chamber in a direction opposite to the spouting direction of said first squish flow, said first and second squish flows cooperating with each other to create a strong swirl motion rotating about a horizontal axis in said combustion chamber;

a depression formed on the inner wall of said cylinder head, a bottom of said depression being upwardly recessed from the extension of a curved surface defining said second squish area so that said bottom does not disturb said second squish flow, said depression extending from a position near the opening of said connecting passage to a position near a ridge of said second raised portion; and

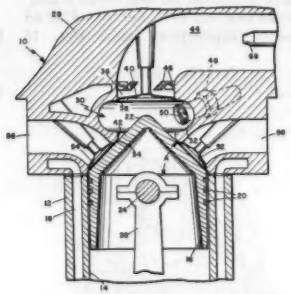
a second spark plug having a spark gap located in said combustion chamber.

4,182,280

VORTEX AUTOMOTIVE COMBUSTION ENGINE

Jack R. Shekleton, San Diego, Calif.

Filed Jun. 2, 1977, Ser. No. 802,778
Int. Cl.[2] F02B *17/00*
U.S. Cl. 123—30 C **16 Claims**



1. In an internal combustion engine of the spark ignition type having at least an intake stroke and a power stroke, a cylinder, a cylinder head closing one end of the cylinder, and a piston reciprocally mounted in said cylinder, the improvement comprising:

an open toroidal combustion chamber formed in the cylinder head and in full open communication with one end of said cylinder and through which the entire charge of combustion air flows into the cylinder,

an inlet port in one end of said combustion chamber in communication with an intake passage for communicating combustion air into said chamber,

inlet value means in said inlet port for controlling the flow of combustion air into said chamber and through said chamber into said cylinder.

an outlet port in the other end of said chamber opening into said cylinder for communicating combustion air hereto, said inlet and outlet ports having substantially the same diameter, and said chamber having a greater diameter than said inlet and outlet ports

means for swirling combustion air flowing into said combustion chamber for centrifugally depositing fuel depositing fuel droplets on the walls of the combustion chamber, for thereby establishing a high fuel to air combustion mixture closely adjacent the walls of the combustion chamber, and

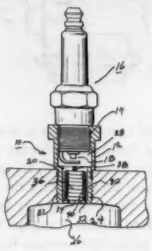
spark ignition means disposed in said combustion chamber closely adjacent the walls of the combustion chamber for igniting said high fuel to air combustion mixture.

4,182,281

SPARK PLUG ADAPTER AND PROCESS

Leo A. Heintzelman, 4990 Burlingame, Wyoming, Mich. 49509

Filed Jul. 18, 1977, Ser. No. 816,347
Int. Cl.[2] F02B *19/18*
U.S. Cl. 123—30 D **23 Claims**



1. A spark plug adapter for an internal combustion engine comprising a tubular member provided with an enlarged upper portion internally threaded to receive a spark plug and the spark-producing means thereof and a smaller lower portion externally threaded and adapter for threading into a spark plug-receiving bore of an internal combustion engine thereby providing a preliminary combustion chamber with an enlarged upper portion surrounding said spark-producing means and with a smaller lower portion opening into said internal combustion engine and, further provided with a relatively thin axially-symmetrical transverse member which extends diametrically across said tubular member below said spark-producing means for dividing the preliminary combustion products into two separate and substantially equal streams and for imparting turbulence thereto as the two streams pass from the preliminary combustion chamber into the main combustion chamber of the internal combustion engine, and in which said lower portion terminates in an annular ledge providing a restricted opening for passage of preliminary combustion products from said said preliminary combustion chamber into said internal combustion engine, said restricted opening functioning to increase the pressure and velocity at which the preliminary combustion products are discharged into the internal combustion engine.

4,182,282

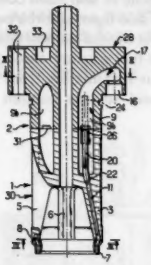
MUSHROOM VALVE HOUSING WITH FLUID COOLANT CIRCULATION FOR INTERNAL COMBUSTION ENGINES

Jean-Pierre Pollet, Arnouville les Gonesse, France, assignor to Societe d'Etudes de Machines Thermiques S.E.M.T., Saint-Denis, France

Filed May 19, 1978, Ser. No. 907,702
Claims priority, application France, Aug. 5, 1977, 77 24240
Int. Cl.[2] F01P *3/14*
U.S. Cl. 123—41.76 **7 Claims**

1. A mushroom valve housing with fluid coolant circulation for internal combustion engines, comprising a cage and at least two pairs of legs or webs supporting at their end an annular valve seat containing an annular space for the said fluid cool-

ant, and a valve guide incorporating an annular cavity for the said fluid coolant, separated by a longitudinal partition into at least two sections, namely a fluid coolant intake section and a fluid coolant return section, a fluid coolant passage leading to the said annular cavity and to the said annular space, respectively, being cut longitudinally in each of the said legs, the fluid coolant passages of two successive legs located on one and the



same side with respect to the said partition opening into the bottom region of a same section, wherein one of the said two fluid coolant passages connected to a same section opens freely into that section whereas the other of the said two fluid coolant passages communicates directly with the other section, and the respective fluid coolant passages of two diametrically opposite legs communicate with a same section.

4,182,283

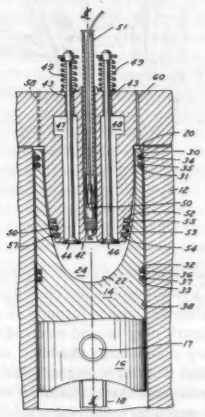
COMBUSTION CHAMBER AND PISTON THEREFOR

Boleslaw J. Czuba, 6256 Mitchell, Detroit, Mich. 48211

Filed Jan. 18, 1978, Ser. No. 870,353

Int. Cl.[2] F02B *59/00*

U.S. Cl. 123—50 R **5 Claims**



1. An improved combustion chamber for an internal combustion engine or the like of the conventional type having pistons reciprocally mounted within a cylinder in a cylinder block and having a cylinder head positioned above the cylinder block, the improvement comprising:

said piston having a continuously curved concave piston head extending from an upper first end of the piston downwardly and inwardly toward the piston second end and defining a continuously curved cavity therein starting from said upper first end adajcent to the outer periphery of said piston,

said cylinder head extending downwardly into said cavity; said cylinder head being generally convex with a truncated end;

said cylinder head providing a constant stationary surface area upon which non-working energy is dissipated upon combustion of gases in said cavity, and said concave piston head providing a moving and increasing surface area upon which combustion forces are exerted for moving said piston;

said continuously curved piston head cavity and the extent of reciprocation of said piston cooperating to avoid combustion forces being exerted on the cylinder block.

4,182,284

DIVIDED AUXILIARY COMBUSTION CHAMBER FOR INTERNAL COMBUSTION SPARK IGNITION ENGINES

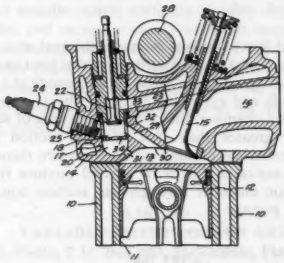
Shizuo Yagi, Asaka; Isao Fujii, Hasuda, and Hiroshi Kogure, Tokorozawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1978, Ser. No. 890,376

Claims priority, application Japan, Jul. 12, 1977, 52-83316; Nov. 4, 1977, 52-132283

Int. Cl.[2] F02M *23/00*

U.S. Cl. 123—75 B **9 Claims**



1. In an internal combustion piston engine, the combination of: walls forming a main combustion chamber, a piston forming one wall of said chamber, means forming an auxiliary combustion chamber, means dividing said auxiliary combustion chamber into a primary cavity and a secondary cavity, means including a main intake passage for supplying a relatively lean air-fuel mixture to said main combustion chamber, means including an auxiliary intake passage for supplying a relatively rich air-fuel mixture to said primary cavity, a relatively long primary torch passage extending from said primary cavity to said main combustion chamber and having an outlet end positioned near the center of said main combustion chamber, a relatively short secondary torch passage extending from said secondary cavity to said main combustion chamber and having an outlet end positioned adjacent a peripheral zone of said main combustion chamber, an opening connecting said primary and secondary cavities, and a spark plug having electrodes communicating with said auxiliary chamber, said primary torch passage and said secondary torch passage each being positioned at a location remote from said spark plug electrodes.

4,182,285

CYLINDRICAL TORCH PASSAGE CONSTRUCTION FOR INTERNAL COMBUSTION ENGINE

Shizuo Yagi, Asaka; Isao Fujii, Hasuda, and Masayasu Nishikawa, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

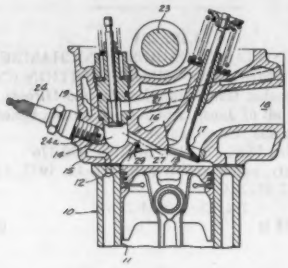
Filed Mar. 27, 1978, Ser. No. 890,511

Int. Cl.[2] F02B *23/00*

U.S. Cl. 123—75 B **3 Claims**

1. In an internal combustion piston engine, the combination of: walls forming a main combustion chamber, a piston forming

one wall of said chamber, means forming an auxiliary combustion chamber, a spark plug having electrodes communicating with said auxiliary combustion chamber, means including a main intake valve for supplying a relatively lean air-fuel mixture to said main combustion chamber, means including an auxiliary intake valve for supplying a relatively rich air-fuel mixture to said auxiliary combustion chamber, a cylindrical torch passage extending from said auxiliary combustion chamber to said main combustion chamber and having an outlet end positioned near the center of said main combustion chamber,



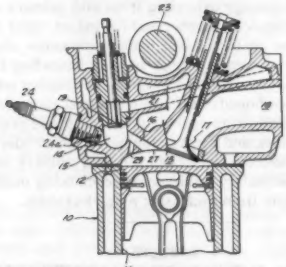
said cylindrical torch passage being positioned at a location remote from said spark plug electrodes, and at least one suction conduit intersecting said cylindrical torch passage at a location between its ends and extending to a peripheral zone of said main combustion chamber, the cross section area of said torch passage being greater than that of said suction conduit, whereby movement of burning air-fuel mixture through said torch passage aspirates a flow of air-fuel mixture from said main combustion chamber through said suction conduit and into said torch passage.

4,182,286

TAPERED TORCH PASSAGE CONSTRUCTION FOR INTERNAL COMBUSTION

Shizuo Yagi, Asaki; Isao Fujii, Hasuda, and Atsushi Tanaka, Matsudo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1978, Ser. No. 890,512
Claims priority, application Japan, Sep. 29, 1977, 52/116087
Int. Cl.[2] F02B *23/00*
U.S. Cl. 123—75 B **2 Claims**



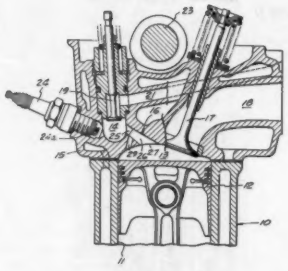
1. In an internal combustion piston engine, the combination of: walls forming a main combustion chamber, a piston forming one wall of said chamber, means forming an auxiliary combustion chamber, a spark plug having electrodes communicating with said auxiliary combustion chamber, means including a main intake valve for supplying a relatively lean air-fuel mixture to said main combustion chamber, means including an auxiliary intake valve for supplying a relatively rich air-fuel mixture to said auxiliary combustion chamber, a tapered torch passage having a small end communicating with said auxiliary combustion chamber and having a large outlet end positioned near the center of said main combustion chamber, said tapered torch passage being positioned at a location remote from said spark plug electrodes, and a suction conduit intersecting said tapered torch passage at a location between its end and extending to a peripheral zone of said main combustion chamber, the cross section area of said tapered torch passage being greater at all locations than that of said suction conduit, whereby movement of burning air-fuel mixture through said torch passage aspirates a flow of air-fuel mixture from said main combustion chamber through said suction conduit and into said torch passage.

4,182,287

TORCH PASSAGE CONSTRUCTION FOR STRATIFIED CHARGE ENGINE

Shizuo Yagi, Asaka; Isao Fujii, Hasuda, and Masayasu Nishikawa, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1978, Ser. No. 890,514
Claims priority, application Japan, Sep. 29, 1977, 52-116087
Int. Cl.[2] F02B *23/00*
U.S. Cl. 123—75 B **7 Claims**



1. In an internal combustion piston engine, the combination of: walls forming a main combustion chamber, a piston forming one wall of said chamber, means forming an auxiliary combustion chamber, a spark plug having electrodes communicating with said auxiliary combustion chamber, means including a main intake passage for supplying a relatively lean air-fuel mixture to said main combustion chamber, means including an auxiliary intake passage for supplying a relatively rich air-fuel mixture to said auxiliary combustion chamber, a relatively long torch passage extending from said auxiliary combustion chamber to said main combustion chamber and having an outlet end positioned near the center of said main combustion chamber, said torch passage being positioned at a location remote from said spark plug electrodes, and a relatively short suction conduit intersecting said torch passage at a location between its ends and extending to a peripheral zone of said main combustion chamber, the cross section area of said torch passage being greater than that of said suction conduit, whereby movement of burning air-fuel mixture through said torch passage aspirates a flow of air-fuel mixture from said main combustion chamber through said suction conduit into said torch passage.

4,182,288

MIXTURE-COMPRESSING, SPARK-IGNITED INTERNAL COMBUSTION ENGINE HAVING A COMBINED THROTTLE AND COMPRESSION CONTROL

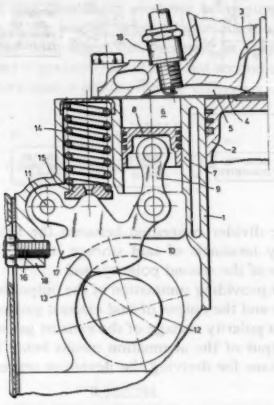
Peter Thauer, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,544

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2705339

Int. Cl.² F02B *75/04*

U.S. Cl. 123—78 AA **8 Claims**



1. A mixture compressing, spark-ignited internal combustion engine comprising a main piston arranged to move within a main cylinder; a crankshaft driven by the main piston; an auxiliary piston arranged to move within an auxiliary cylinder, the auxiliary compression chamber defined by the auxiliary piston and auxiliary cylinder being connected with the main compression chamber defined by the main piston and main cylinder; a drive shaft including means for driving said auxiliary piston; a drive means coupled between the crankshaft and the drive shaft for rotating the drive shaft with half the speed of the crankshaft; and a control device, responsive to operating parameters of the internal combustion engine, for varying the phase position of the auxiliary piston relative to the main piston thereby to vary the combined volume of the main and auxiliary compression chambers at compression top dead center of the main piston in accordance with said operating parameters, wherein said control device includes a controllable hydraulic coupling arranged between the crankshaft and the drive shaft.

4,182,289

VARIABLE VALVE TIMING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yasuo Nakajima, Yokosuka, and Yoshimasa Hayashi, Yokohama, both of Japan, assignors to Nissan Motor Co., Limited, Yokohama, Japan

Filed Nov. 11, 1976, Ser. No. 741,120

Claims priority, application Japan, Nov. 17, 1975, 50-137938

Int. Cl.² F01L *1/24*

U.S. Cl. 123—90.16 **7 Claims**

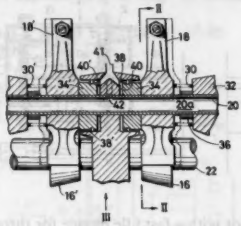
1. A variable valve timing system for an overhead cam internal combustion engine having an overhead cam comprising:

a valve having stem and biased towards a closed position by a valve spring;

a rocker lever shaft;

a cam shaft having an axis parallel to said rocker lever shaft; said cam secured to said cam shaft, said cam being tapered in the longitudinal direction along said axis and having a uniform cross-sectional shape;

a rocker lever being axially reciprocally movable and pivotably mounted on said rocker lever shaft, said rocker lever having a tappet at one end portion thereof positioned to contact said stem and a follower at the opposite end portion thereof with a follower having a surface position to operatively engage said cam; and



a cylinder mounted coaxially with said rocker lever shaft and an annular piston sealingly slidably disposed in said cylinder and on said rocker lever shaft respectively, said piston abutting said rocker lever at one end and defining at the other end a chamber within said cylinder, said chamber communicating with pump means for providing fluid having pressure which increases with the increase in revolution speed of the engine.

4,182,290

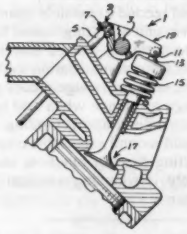
VARIABLE RATIO ROCKER ARM

William A. Pohle, P.O. Box 684, Hallandale, Fla. 33009

Filed Jun. 22, 1978, Ser. No. 918,061

Int. Cl.² F01L *1/18*

U.S. Cl. 123—90.39 **5 Claims**



1. In a valve lifter rocker arm structure for mounting upon a shaft for oscillatory motion around said shaft wherein end portions of said rocker arm structure extend on either side of said shaft and one of said end portions has means for engaging and lifting the valve of an internal combustion engine, the combination comprising

a seat member rotatably mounted in the other end portion of said rocker arm structure,

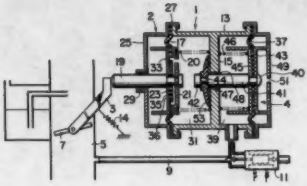
said seat member having a depression eccentrically located therein for receiving and seating a conventional pushrod to operate said rocker arm structure, and

means for locking said seat member in a desired position, whereby the effective length of said other end portion of the rocker arm structure may be either of two preselected values in accordance with the position of said eccentrically located depression.

4,182,291
DASHPOT WITH FAST IDLE DEVICE FOR CARBURETOR THROTTLE

Tomo Ito, Katuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 15, 1977, Ser. No. 851,693
Claims priority, application Japan, Dec. 1, 1976, 51-143433
Int. Cl.[2] F02D *11/08*
U.S. Cl. 123—103 R 11 Claims



1. A dashpot with a fast idle device for throttle valves comprising:

a first expansible chamber having partition means which defines a part of said first expansible chamber;

a second expansible chamber, a part of which is defined by said partition means;

a push rod, a part of which is disposed in and mechanically connected to said first expansible chamber to axially move according to movement of said first expansible chamber, another part of which is disposed in said second expansible chamber, passing through a hole made in said partition means;

a resilient seal member disposed in said second expansible chamber and including a first portion airtightly engaging with said push rod, a second portion surrounding a gap defined by said push rod passing through said hole and the inner wall of said hole of said partition means and airtightly contacting with said partition means to seal said gap, and a third portion extending from said first portion to said second portion and having a shape such that said second portion is pressed more tightly on said partition means as the pressure difference between said first and second expansible chamber increases;

means secured to said second expansible chamber for actuating a throttle valve, said actuating means facing said push rod and being intermittently pushed thereby;

an air passage means for communicating said second chamber to atmosphere, said air passage means providing relatively small passage resistance when said second expansible chamber is expanding, and providing larger passage resistance when said second expansible chamber is shrinking, thereby effecting dashpot function; and

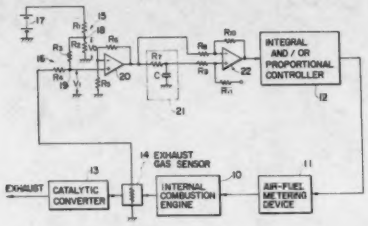
means for selectively introducing vacuum into said first expansible chamber.

4,182,292
CLOSED LOOP MIXTURE CONTROL SYSTEM WITH A VOLTAGE OFFSET CIRCUIT FOR BIPOLAR EXHAUST GAS SENSOR

Makoto Anzai, Yokosuka, and Akio Hosaka, Yokohama, both of Japan, assignors to Nissan Motor Co., Limited, Yokohama, Japan

Filed May 26, 1978, Ser. No. 909,945
Claims priority, application Japan, May 27, 1977, 52-67612[U]
Int. Cl.[2] F02B *3/08*
U.S. Cl. 123—119 EC 3 Claims

1. A closed-loop mixture control system for an internal combustion engine in a motor vehicle including an exhaust gas sensor disposed in the exhaust system of the engine for sensing the concentration of an exhaust composition, air-fuel supplying means for supplying air and fuel to said engine, said exhaust gas sensor being of the type which generates a signal varying between a first polarity voltage level and a second polarity voltage level depending upon whether the sensed concentration is above or below a predetermined value, and means for deriving a control signal representative of the deviation of air-fuel ratio within said exhaust system, as represented by the sensed concentration, from a desired air-fuel ratio for adjusting said air-fuel supplying means, said vehicle including a storage battery having first and second polarity voltage terminals wherein the first polarity voltage terminal is connected to be used as a reference potential, wherein the improvement comprises:



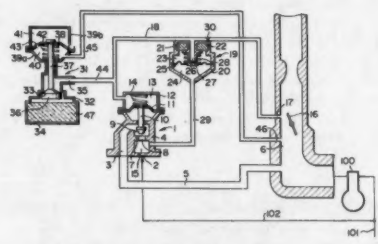
a voltage divider connected between the first and second polarity terminals of said storage battery to develop a voltage of the second polarity; and

means for providing summation of the output of said voltage divider and the output of said exhaust gas sensor to offset the first polarity voltage of the exhaust gas sensor output, the output of the summation means being connected to said means for deriving the deviation representative signal.

4,182,293
EXHAUST GAS RECIRCULATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Noboru Toyama, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota

Filed Apr. 19, 1978, Ser. No. 897,869
Claims priority, application Japan, Dec. 29, 1977, 52/159302
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A 7 Claims



1. An exhaust gas recirculation system for an internal combustion engine having an intake passage incorporating a throttle valve therein and an exhaust passage, comprising a recirculation passage for recirculating exhaust gases from said exhaust passage to said intake passage, an exhaust gas recirculation control valve provided at a middle portion of said recirculation passage, said control valve having a diaphragm chamber and being adapted to increase its opening in accordance with increase of vacuum supplied to said diaphragm chamber, a vacuum port provided in said intake passage so as to be located upstream of said throttle valve when it is fully closed and so as to be located downstream of said throttle valve when it is opened beyond a predetermined opening, a vacuum passage

which connects said vacuum port and said diaphragm chamber of said exhaust gas recirculation control valve, a vacuum control valve provided at a middle portion of said vacuum passage and being adapted to control the vacuum conducted through said vacuum passage in accordance with the pressure of exhaust gases in said recirculation passage, and a relief valve for selectively opening said diaphragm chamber of said exhaust gas recirculation control valve to the atmosphere, said relief valve having a relief port for opening said diaphragm chamber of said exhaust gas recirculation control valve to the atmosphere, a diaphragm means including first and second diaphragm chambers and controlling said relief port, and a throttling passage which connects said first and second diaphragm chambers, said first diaphragm chamber being supplied with intake vacuum of the engine, wherein said diaphragm means opens said relief port when the vacuuum in said first diaphragm chamber is greater than that in said second diaphragm chamber by more than a predetermined difference.

4,182,294

APPARATUS FOR INJECTING FUEL INTO A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE HAVING A SUPERCHARGING COMPRESSOR

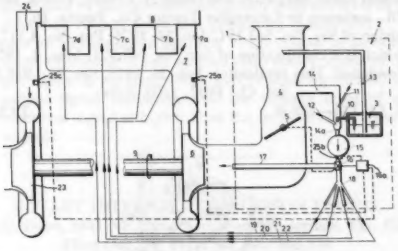
Klaus-Dieter Emmenthal, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,561

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737849

Int. Cl.[2] **F02B** *37/00, 15/00;* **F02M** *39/00;* **F02B** *33/42*

U.S. Cl. 123—119 C **8 Claims**



1. In a multi-cylinder internal combustion engine having an intake assembly comprising an intake manifold communicating with cylinder intake ports, an intake passage connected to said manifold and a supercharging compressor in said intake passage, apparatus for injecting fuel into said intake assembly comprising first fuel injection means for injecting fuel into said manifold adjacent said intake ports, second fuel injection means for injecting fuel into said passage upstream of said compressor, and controlled means for supplying fuel primarily to said first fuel injection means at lower engine loads, and for supplying a progressively larger portion of the fuel to said second fuel injection means with increasing engine load.

4,182,295

METHOD AND APPARATUS FOR ENGINE FUEL CONTROL

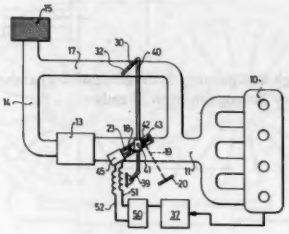
Hans Zeller, Grafenau; Reinhard Latsch, Vaihingen; Johannes Brettschneider, Ludwigsburg, and Valerio Bianchi, Hochdorf, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 701,175, Jun. 30, 1976, abandoned. This application Oct. 24, 1978, Ser. No. 954,146

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1975, 2529178

Int. Cl.[2] **F02B** *3/00;* **F02M** *37/00*

U.S. Cl. 123—119 EC **16 Claims**



2. An apparatus for the closed loop control of the fuel-air mixture of an internal combustion engine, said engine including an air intake tube, fuel-air mixture generator means, an induction manifold and a main throttle in said induction manifold, comprising:

a bypass conduit leading directly to said induction manifold, bypassing said generator means;

a bypass valve disposed within said bypass conduit for controlling the air flow therethrough;

means for sensing motion of the main throttle and effecting a corresponding motion transfer of said bypass valve; and

means for changing the degree of motion transfer exerted by said means for sensing, on the basis of engine parameters which vary as the fuel-air mixture composition varies, wherein the transmission ratio as between the position of the main throttle and the bypass valve may be changed in the range from 0 to 1, independently of the position of the main throttle and with a changing rate over said range which is independent of said engine parameters.

4,182,296

APPARATUS PERMITTING AN IMPROVEMENT OF THE CARBURETION OF INTERNAL COMBUSTION ENGINES

Jean-Claude Fayard, Lyon, France, assignor to Elf Union, Paris, France

Filed Jun. 29, 1977, Ser. No. 810,940

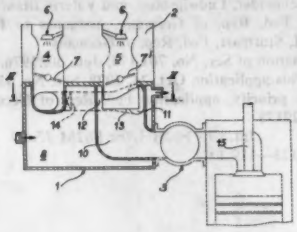
Claims priority, application France, Jul. 8, 1976, 76 20906

Int. Cl.[2] **F02M** *31/00*

U.S. Cl. 123—122 A **8 Claims**

1. An apparatus for improvement in the carburetion of internal combustion engines adapted to be connected to the downstream end of a multibody carburetor comprising at least one primary body for forming a primary air/fuel mixture and at least one secondary body for forming a secondary air/fuel mixture when the engine is under full load, said apparatus comprising a body forming primary and secondary homogenization chambers connected respectively to said primary and secondary bodies, said primary homogenization chamber being connected to the top of said secondary homogenization chamber, a housing substantially surrounding said primary and secondary chambers and adapted to receive a heating fluid,

each primary homogenization chamber being equipped with means for giving the mixture a centrifugal movement as it



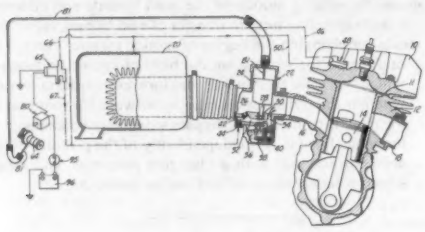
passes through said primary homogenization chamber and into said secondary homogenization chamber.

4,182,297

HEAT CONTROL SYSTEM FOR A TWO-CYCLE ENGINE

Yasuo Ikenoya, Kawagoe, and Masaaki Uchida, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 635,928, Nov. 28, 1975, abandoned. This application Dec. 30, 1977, Ser. No. 865,998
Claims priority, application Japan, Dec. 7, 1974, 49-148192
Int. Cl.[2] F02M *23/04;* F02B *33/04*
U.S. Cl. 123—124 A **5 Claims**



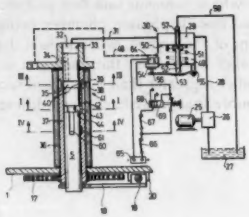
1. In a two-cycle air-cooled engine having a carburetor for supplying a controlled air-fuel mixture to the engine and having an induction passageway including a first air inlet and a fuel inlet, fuel being drawn into said induction passageway through the fuel inlet by passage of air through said induction passageway, the improvement comprising: a second air inlet to said induction passageway, an air line connected to said second air inlet, a heat sensitive valve assembly mounted on the engine head and operatively interposed in said air line, so that when the engine is operating at normal temperatures said air line remains open to supply additional air to the induction passageway, and so that excessive temperature of the engine head causes the valve assembly to close and thereby enrich the mixture being supplied through the induction passageway to prevent seizure, the carburetor having a throttle valve, means including a manually operated control member for operating said throttle valve, means including another valve for delivering additional air into said induction passageway, said means being responsive to the position of said control member, whereby the air-fuel mixture in the induction passageway is leaned by the addition of air when the engine is idling.

4,182,298

WARM-UP CONTROL APPARATUS FOR A FUEL SUPPLY SYSTEM

Max Greiner, Gerlingen, and Hermann Nusser, Asperg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 801,871, May 31, 1977. This application Dec. 27, 1978, Ser. No. 973,662
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628666
Int. Cl.[2] F02B *3/00;* F02M *1/02*
U.S. Cl. 123—139 AW **9 Claims**



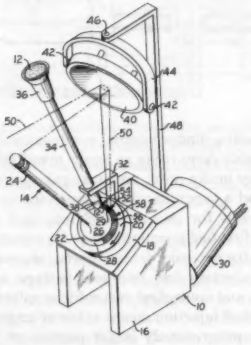
1. Warm-up control apparatus for a fuel supply system of an externally ignited internal combustion engine including a fuel apportioning valve, a pressure control valve for maintaining the pressure differential at said fuel apportioning valve, said pressure control valve having a movable valve component biased on one side by means of a fuel pressure, a first spring for biasing said movable valve component on the other side, a second spring for yieldingly urging said movable valve component into a valve closing position during the warm-up phase of the internal combustion engine and a temperature dependent element movable between an operative position in engagement with said second spring for removing the urging force of said second spring on said movable valve component after completion of the warm-up phase of said engine and an inoperative position out of said engagement with said second spring during said warm-up phase.

4,182,299

ENGINE VALVE

Michael Earle, Mapleton, and Glenn H. Lenzen, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 543,191, Jan. 24, 1975, Pat. No. 4,117,302, which is a continuation of Ser. No. 447,971, Mar. 4, 1974, abandoned. This application Jun. 26, 1978, Ser. No. 919,348
Int. Cl.[2] F01L *3/00, 3/04*
U.S. Cl. 123—188 R **3 Claims**



1. An engine valve comprising:

a valve head of an alloy steel base material;

an annular valve seat layer of a metallic alloy material different than the alloy steel base material, the valve seat layer being fusibly bonded to the valve head by a beam of electromagnetic energy; and

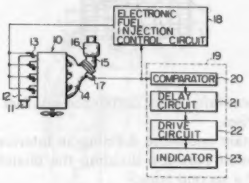
a region of interstitial bond between the valve head and the valve seat layer having a thickness of about 0.003" (0.075 mm), having properties derived from both the alloy steel base material and the metallic alloy material, and defining a relatively abrupt descendency of the relative concentration of iron from the amount present in the alloy steel base material toward a negligible amount in the valve seat layer.

4,182,300

TROUBLE WARNING DEVICE FOR AN AIR-FUEL RATIO SENSOR

Hironobu Ono, and Minoru Bito, both of Toyota, Japan, assignors to Toyota Judosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 1, 1978, Ser. No. 874,332
Claims priority, application Japan, Feb. 1, 1977, 52-9186
Int. Cl.[2] F02B *77/08*
U.S. Cl. 123—198 D **6 Claims**



1. A trouble warning device for an air-fuel ratio sensor mounted in an internal combustion engine, said air-fuel ratio sensor in normal operation generating electrical signals having a first voltage level which indicates one air-fuel ratio condition of the engine and a second voltage level which indicates another air-fuel ratio condition of the engine, said trouble warning device comprising:

means for generating a reference voltage having a level higher than both the first and second voltage levels of the normal electrical signals;

means for comparing the voltage level of an electrical signal generated by said air-fuel ratio sensor with the level of the reference voltage from said generating means; and

means for informing an operator of the engine of an occurrence of trouble in said air-fuel ratio sensor when an output signal is received from said comparing means, said output signal indicating that the voltage level of said electrical signal is higher than the level of said reference voltage.

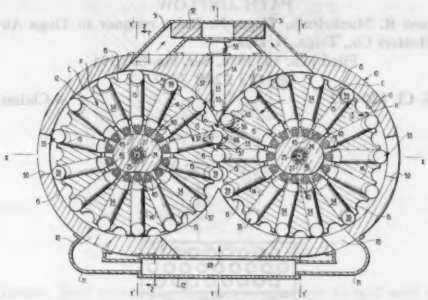
4,182,301

ROTARY INTERNAL COMBUSTION ENGINE

Joe O. Dean, 5841 NE. 22nd Ave., Fort Lauderdale, Fla. 33308

Filed Dec. 28, 1977, Ser. No. 865,139
Int. Cl.[2] F02B *53/00*
U.S. Cl. 123—246 **11 Claims**

1. A rotary internal combustion engine comprising a housing having a pair of communicating parallel axis rotor chambers, said housing having air intake passage means and engine exhaust passage means for each chamber, a pair of parallel axis rotors, one in each chamber and eccentric thereto, said rotors each having a plurality of circumferentially spaced peripheral pockets and a plurality of intervening circumferentially spaced radial passages in alignment and communicating with alternate pockets on each rotor, piston bodies movably engaged within said radial passages, vane-piston rollers carried by the outer ends of said piston bodies and adapted to enter and seat within the rotor pockets which are in communication with the radial passages and also adapted to enter the unoccupied pockets of the opposing rotor during counter-rotation of both rotors in said chambers, said vane-piston rollers intermeshing during such counter-rotation, relatively stationary cam means connected with said housing and being in engagement with inner ends of the piston bodies and displacing the piston bodies radially during counter-rotation, relatively stationary fuel injection means on said housing including one pair of injection nozzles to inject fuel into a primary combustion chamber of the engine between portions of the peripheries of said rotors and



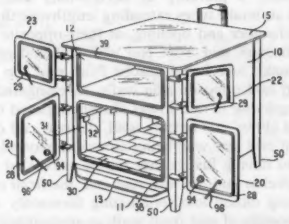
portions of the walls of said chambers and the rotating intermeshing vane-piston rollers of said rotors, said fuel injection means including a second pair of injection nozzles to inject fuel into a secondary combustion chamber of the engine formed by each pocket of each rotor and the vane-piston roller of the opposing rotor which enters each pocket and is completely engaged therein substantially on a common plane through the rotational axes of said rotors, and said housing having air-fuel induction passage means leading into said engine primary combustion chamber.

4,182,302

WOOD BURNING STOVE

Ray F. Bruce, P.O. Box 293, Tahoe Vista, Calif. 95732, and William W. Byrd, Jr., Wilseyville, Calif., assignors to Ray F. Bruce, Incline Village, Nev.

Filed Mar. 21, 1977, Ser. No. 779,331
Int. Cl.[2] F24B *1/08*
U.S. Cl. 126—4 **3 Claims**



1. In a wood burning stove, the combination with a primary combustion chamber lined with brick, having some of the bricks vertically disposed within the said primary combustion chamber and held in position with clips, clipping alternate pairs of said bricks in position; of a secondary combustion chamber having baffle means therein for recirculation therein; and a flue pipe interconnected to said secondary chamber and extending outside of said stove with an upward and downward connection attached thereto, wherein the downward connection is provided with an opening suitable to draw cool air into the upward connection and having a flue portion containing a

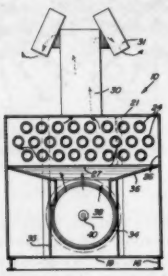
barometric damper located at right angles to said downward connection and communicating with said opening, said secondary combustion chamber being elevated from the primary chamber; and a heat radiating compartment located above the primary combustion chamber and depending into the secondary combustion chamber, said heat radiating compartment being provided with doors so that it may be used as an oven.

4,182,303

STACKED INDIRECT AIR HEATER WITH SINGLE PATH AIRFLOW

Ernest R. Muckelrath, Tioga, N. Dak., assignor to Tioga Air Heaters Co., Tioga, N. Dak.

Filed Feb. 15, 1978, Ser. No. 877,991
Int. Cl.[2] F24B 7/00
U.S. Cl. 126—72 **4 Claims**



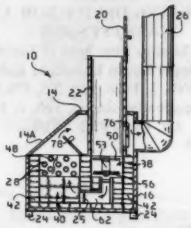
1. An air heater including a hollow rectangular housing having top and bottom walls interconnected by upstanding opposite side and front and rear end walls, said end walls including upper and lower portions, a generally horizontal elongated partition extending between said side walls from said front end wall rearward to and terminating a spaced distance forward of said rear end wall, an upstanding partial wall connected and extending vertically between the rear end of said partition and said top wall and horizontally between the portions of said side walls disposed above rear end of said partition, said partition dividing the interior of said housing forward of said partial wall into upper and lower chambers, said partition and top wall defining an elongated closed preheating chamber therebetween extending between said one end and said partial back wall, said preheating chamber comprising said upper chamber, a plurality of horizontally and vertically spaced fresh air intake tubes extending lengthwise through said preheating chamber and opening, at their opposite front and rear ends, through said front end wall and said partial back wall, said intake tube being spaced from said top wall, said partition and said opposite side walls, an elongated fire tube disposed lengthwise in said lower chamber spaced below said partition and above said bottom wall, the rear end of said fire tube adjacent said rear wall being closed, supported from said rear wall and having fuel burner means associated therewith for burning fuel in said fire tube rear end, the front end of said fire tube being closed and terminating forwardly at a point spaced rearwardly of said front wall, an upstanding duct supported within said housing, said duct being spaced inwardly of said side walls and rearwardy of said front wall, the lower end of said duct opening downwardly into the forward end of said fire tube, the upper end of said duct opening upwardly through the forward end of said partition, said housing including a flue outlet opening into said preheating chamber adjacent and forward of said partial back wall, blower means stationarily supported forward of said front wall and including an air inlet opening into the interior of said housing through said front wall below said partition, said fresh air intake tubes and the interior of said housing exteriorly of said preheating chamber fire tube and said duct comprising portion of fresh air passage means defined in said housing for fresh air to be heated to pass through and be preheated and thereafter further heated in said housing, the fresh air passing through said fresh air passage means entering through the ends of said intake tubes, opening through said front end wall and egressing from said housing through said blower means inlet.

4,182,304

DOWNDRAFT FURNACE

Peter Mele, Dover Rd., Barneveld, N.Y. 13304

Filed Sep. 29, 1977, Ser. No. 837,859
Int. Cl.[2] F24B 5/04
U.S. Cl. 126—76 **13 Claims**



13. A downdraft, solid carbonaceous fuel fired furnace, which comprises;

a heat-resistant enclosure defining an interior chamber;

a heat-resistant partition dividing the chamber into a first zone and a second zone;

thermal insulation lining the walls of the first and second zones;

a passageway through said partition with an inlet in the first zone and an outlet in the second zone;

a first set of a plurality of heat-exchanger tubes traversing the second zone, having inlets opening outside of the enclosure and outlets opening into a first conduit having an outlet into the first zone;

a second set of a plurality of heat-exchanger tubes traversing the second zone, having inlets opening outside of the enclosure and outlets opening into a second conduit having an outlet into the first zone;

a first grate mounted in the first zone and adapted to support log fuels;

a second grate mounted below said first grate and adapted to support coals;

a fuel loading chute passing through the enclosure above said grates and having a first end outside said enclosure and a second open end terminating above said first grate;

a manifold pipe having a plurality of apertures distributed substantially evenly along its length on upper end lower surfaces mounted on the outlets of the first and second conduits and traversing the first zone at a point between the first grate and second grates;

a first air control member having a plurality of apertures distributed substantially evenly along its length and traversing its body to communicate between upper and lower surfaces, said apertures corresponding in size and location to the apertures on the upper surface of the manifold pipe, said air control member being slidably mounted on the upper surface of said manifold pipe so that the apertures of the upper surface of the pipe may be aligned and misaligned with the apertures of the air control member by sliding said air control member on the upper surface of the manifold pipe;

a second air control member having a plurality of apertures distributed substantially evenly along its length and traversing its body to communicate between upper and lower surfaces, said apertures corresponding in size and location to the apertures on the lower surface of the mani-

fold pipe, said second air control member being slidably mounted on the lower surface of said manifold pipe so that the apertures of the lower surface of the pipe may be aligned and misaligned with the apertures of the lower surface of the second air control member by sliding said second air control member on the lower surface of the manifold pipe; and

a heat radiator section above the second zone and in open communication therewith at one end and in communication with a flue stack at its other end, said section including baffle means to form a maze for gases exhausted from the second zone to the flue stack, said chute forming part of the baffle means.

4,182,305

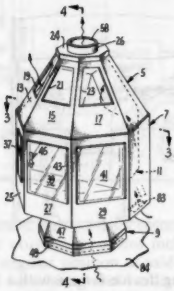
APOLLO MODEL FIREPLACE

William R. Johnson, Santa Cruz, Calif., assignor to Chinook Manufacturing Co., Santa Cruz, Calif.

Filed Dec. 8, 1977, Ser. No. 858,627

Int. Cl.² F24B *1/18*

U.S. Cl. 126—120 **4 Claims**



1. A metal fireplace comprising in combination:

a. body portion of octagonal configuration formed by eight generally rectangular body panels,

b. eight converging top panels of trapezoidal shape attached to the tops of said side members,

c. an elevated base member supporting said body panels,

d. at least three of said adjacent body panels having transparent, heat-resisting glass therein,

e. vent members in at least those of said top panels lying over each of the glass sections,

f. a firebox within said body portion,

g. a hearth extending forward from the firebox, directly behind and below the body panels of paragraph d,

h. said base member being of octagonal configuration and being hollow whereby air can pass through base member, said base member having a central opening under the center of said firebox,

i. a passageway for combustion air from said central opening through a space under said firebox,

j. an opening from said space under the said firebox at the front of said fireplace whereby combustion air can pass upwardly through said hollow base, pass under said firebox through the space provided, to the front of the firebox, and a passage from said front over said hearth and into said firebox.

4,182,306

HEAT TRANSFER DEVICE

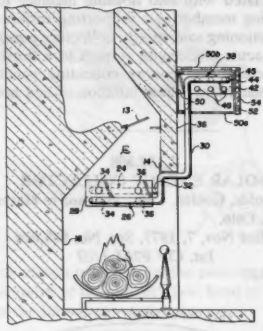
John L. Tomich, 2102 Apollo Rd., Richardson, Tex. 75081

Filed Dec. 27, 1977, Ser. No. 864,327

Int. Cl.² F24B *7/00*

U.S. Cl. 126—121 **10 Claims**

1. Apparatus to transfer heat from a fireplace to a room comprising: a first heat exchanger means positioned above the fire within the fireplace; a second heat exchanger means positioned in a remote location within the room at a level above the first heat exchanger; a connector tube connecting the first heat exchanger means with the second heat exchanger means; and heat transfer fluid disposed within the first heat exchanger means such that heat rising from the fireplace will cause the



transfer fluid within the first heat exchanger to boil with the vapor rising through the connecting tube to the second heat exchanger means, said vapor giving up its heat in the second heat exchanger means and condensing back to a liquid which falls back through the connecting tube to the first heat exchanger means, said second heat exchanger means transferring the heat to the surrounding air for heating the room.

4,182,307

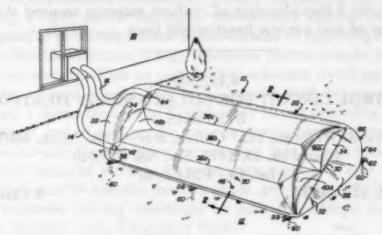
INFLATABLE SOLAR ENERGY COLLECTOR

Dannie K. Brindle, 12797 W. 7th Ave., Golden, Colo. 80401, and Donald Y. Shanfelt, 12844 W. Iliff Ave., Lakewood, Colo. 80228., assignors to Donald Shanfelt; Dannie K. Brindle; Dennis D. Kiser; David W. Armagast and Patrick J. Lynch, part interest to each

Continuation-in-part of Ser. No. 817,992, Jul. 21, 1977. This application Mar. 8, 1978, Ser. No. 884,418

Int. Cl.² F24J *3/02*

U.S. Cl. 126—432 **16 Claims**



1. An inflatable solar energy collector adapted to be positioned on a supporting surface and to be inflated by a flow of pressurized gas therethrough, said collector being operative to collect solar energy and transfer a substantial portion of the energy collected to the gas flowing therethrough, comprising:

a closed housing member generally defining a tubular structure having an interior volume, said housing member comprising flexible material and having a front portion thereof comprising solar radiation transparent material;

an energy collecting panel comprising solar energy absorbing flexible material, said energy collecting panel being operatively connected within the interior volume of said

housing member, said energy collecting panel operatively extending in a planar and chord-like manner across the interior of said housing member facing the front portion of said housing member;

means operatively associated with said energy collecting panel for defining a gas conducting conduit over a substantial part of said energy collecting panel, said conduit defining means comprising flexible material; and

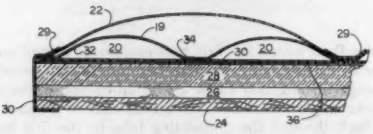
means associated with said housing member for attaching said housing member to a supporting surface and operatively positioning said energy collecting panel at a predetermined acute angle with respect to a horizontal reference, whereby said energy collecting panel efficiently absorbs solar energy upon inflation of said housing member.

4,182,308

SOLAR ENERGY COLLECTOR

James E. Reynolds, Golden, Colo., assignor to Hazen Research, Inc., Golden, Colo.

Filed Nov. 7, 1977, Ser. No. 849,026
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—437 **18 Claims**



1. A solar energy collector for collecting and utilizing solar energy comprising:

(a) at least one heat absorber including upper and lower plies sealed together along spaced apart narrow longitudinal lines to provide channels between said lines for passage of heat transfer fluids therethrough, said channels being connected at their alternate ends by spaces formed by alternate ends of adjacent lines being left unsealed;

(b) at least one curved solar energy collector cover mounted over the top of said heat absorber with its upper convex surface facing outwardly and

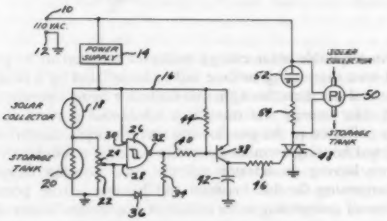
(c) retainer means secured to the top of said heat absorber for receiving longitudinal edges of said solar collector cover to retain said solar collector cover in operative position over said heat absorber, said retainer means includes a flap-like strip of resilient material secured along one of said narrow longitudinal lines.

4,182,309

CONTROL CIRCUIT FOR SOLAR ENERGY HEATING SYSTEMS

Theodore R. Williams, 1927 Clifton, Royal Oak, Mich. 48073

Filed Feb. 13, 1978, Ser. No. 877,020
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—422 **8 Claims**



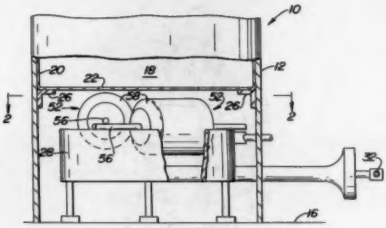
1. In a solar heating system, a circuit for controlling electrical apparatus as a function of temperature comprising first and second temperature sensitive means each having an electrical conductance which varies as a function of temperature, means connecting said first and second means in series across a source of electrical power such that a voltage at the junction between said first and second means varies as a function of a differential in temperatures sensed by said first and second means, a negative feedback high frequency oscillator responsive to said temperature differential to provide a high frequency signal having an amplitude which varies as a function of said temperature differential, and switch means responsive to said amplitude of said high frequency signal for controlling a fluid transfer pump in a solar heating system as a function of said temperature differential.

4,182,310

HEAT RETAINING DEVICE

Michael Sabo, 1001 E. Price St., Philadelphia, Pa. 19138

Filed Nov. 23, 1977, Ser. No. 854,362
Int. Cl.[2] F24H *7/06*
U.S. Cl. 126—400 **9 Claims**



1. A heat retaining device for use with a hot water heater of the type that includes a pilot light and a selectively energizable burner for a fuel which is ignited by the pilot light and which has a chamber for the water which is to be heated disposed above the burner, and wherein the burner includes an outer annular burner element and an arm therein and connected thereto for directing fuel to the annular burner element comprising, at least one heat retaining element; said heat retaining element comprising an elongated heat transfer element and an enlarged heat retaining member; said enlarged heat retaining element being disposed intermediate the ends of said elongated heat transfer element and being supported thereby, and being disposable on the burner between the burner and the water heating chamber when said elongated heat transfer element is supported by said annular burner element so that said heat retaining member can absorb heat when said burner is energized and release heat when said burner is de-energized to continue to heat water in the water heating chamber; and at least a portion of said elongated heat transfer element is disposed so that it can be in contact with the pilot light to provide a continuous supply of heat by way of the heat transfer element to the heat retaining element when the burner is de-energized.

4,182,311

METHOD AND SYSTEM FOR CARDIAC COMPUTED TOMOGRAPHY

Edward J. Seppi, Menlo Park; George S. Harell, Portola Valley, and Charles C. Morehouse, Cupertino, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 22, 1977, Ser. No. 789,910
Int. Cl.[2] A61B *6/02*
U.S. Cl. 128—653 **8 Claims**

8. A system for reconstructing images of selected static cross-sections corresponding to selected phases in the motion of a pulsating heart, comprising in combination:

a source of examining radiation and means adapted for moving said source around an object in a continuous motion;

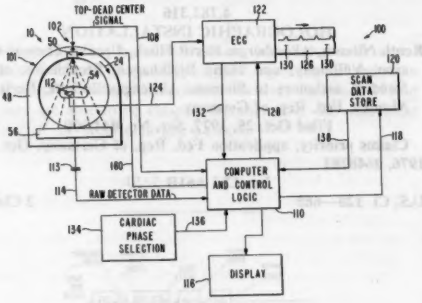
means for receiving said radiation as attenuated by said object and providing scan projection data representative of the attenuated radiation;

means for causing said source to provide scanning radiation during said continuous movement irrespective of the cyclic displacement of said heart occurring at the time of said scanning radiation;

means for storing the scan projection data acquired by said radiation receiving means in examination of said heart;

ECG means adapted to be operatively associated with said heart and providing a signal indicative of the cardiac cycle;

means for correlating the phase of said heart's cyclic displacement sought to be reconstructed with the data pro-



jections which are at least partially coincident in time with said phase, said correlating means including means for correlating the angular position of said source with said ECG signal for correlating said cardiac phases with the said projections at least partially associated therewith; and means for reconstructing a desired image from said associated data projections, said correlating means comprising means for reconstructing the cross-section of said object during any phase throughout the complete displacement cycle of said heart;

said means for correlating the position of said source with said ECG signal including means for developing a positioning signal indicative of a preselected angular position of said source; and

means responsive to said positioning signal to mark the ECG signal record coincident in time with the occurence of said positioning signal.

4,182,312

DENTAL PROBE

David R. Mushabac, 919 Ocean Ave., Brooklyn, N.Y. 11226

Filed May 20, 1977, Ser. No. 798,790

Int. Cl.² A61B *5/10*

U.S. Cl. 433—68 **7 Claims**

1. A dental trace apparatus for providing signals corresponding to the position of intra-oral tissues, including teeth, of a patient, comprising:

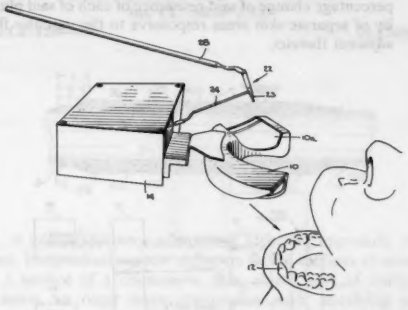
a three dimensional position transducer to provide position signals,

a dental probe operable to probe intra-oral tissues of a patient and operably coupled to said transducer to generate said signals, said signals indicating the position of said probe,

enabling means responsive to contact between said probe and patient's intra-oral tissues to enable said transducer,

said transducer providing said position signals only when enabled, and

indexing means adapted to conform to and to be rigidly connected to the jaw of the patient to which jaw the intra-oral tissues are anchored as a part of the anatomy, and said transducer being achored to said indexing means thereby to form an origin point for said signals which is



fixed with respect to the jaw of the patient, and may move with movement of the patient's jaw, head or body with no effect on the transducer signal generation.

4,182,313

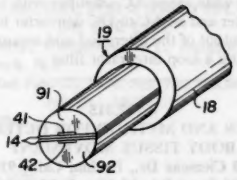
IMPLANTABLE TEMPERATURE PROBE

Edward E. Aslan, Plainview, N.Y., assignor to Narda Microwave Corporation, Plainview, N.Y.

Filed May 31, 1977, Ser. No. 802,115

Int. Cl.² A61B *10/00*

U.S. Cl. 128—736 **6 Claims**



1. An implantable bi-metallic temperature sensing unit comprising a rigid needle having a substantially conical portion designed to penetrate animal tissue, formed of opposing halves and a flexible substrate; a high resistance thermocouple including two metallic films on said flexible substrate overlapping at the tip of said needle and being sandwiched between said halves; a meter means and flexible lead means extending from the distal end of said needle for connecting signals from said thermocouple to said meter means, said lead means including resistive material having characteristics similar to that of the metals in said bi-metallic thermocouple, and said needle including materials having resistance to limit the energy coupled from incident radio frequency fields.

4,182,314

MULTI-CHANNEL VASCULAR FLOW MONITORING SYSTEM

Morris W. Boughton, 3332 Donna Dr., Carlsbad, Calif. 92008

Filed Jul. 11, 1977, Ser. No. 814,315

Int. Cl.² A61B *5/02, 5/05*

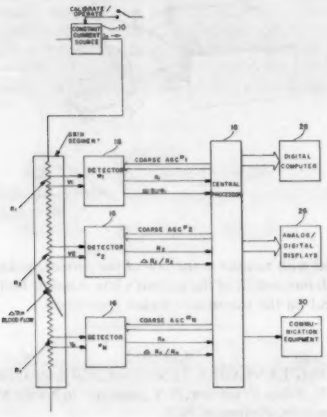
U.S. Cl. 128—693 **11 Claims**

1. In a multi-channel vascular flow monitoring system comprising:

means for applying a constant current through a skin segment for providing an AC voltage thereacross;

means for monitoring increments of said AC voltage across

a plurality of separate skin areas within said skin segment and producing a first voltage signal representative of the resistance across each of said plurality of separate skin areas and a second voltage signal representative of the percentage change of said resistance of each of said plurality of separate skin areas responsive to the vascular flow adjacent thereto;



means for directly measuring each of said first and second voltage signal and separate means for normalizing all of said second voltage signals; and

said monitoring means including detector means comprising a dynamic wide range AC amplifier with a narrow band, high Q, filter and an AC to DC converter having an input from the output of the filter; and said means for normalizing including a loop integrator filter.

4,182,315

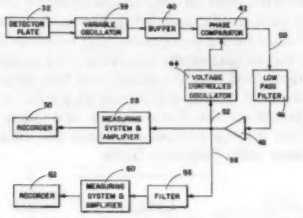
APPARATUS AND METHOD FOR DETECTION OF BODY TISSUE MOVEMENT

Ran Vas, 17130 Clemons Dr., Encino, Calif. 91436; James S. Forrester, 3226 Serra Rd., Malibu, Calif. 90265, and George A. Diamond, 2408 Wild Oak Dr., Los Angeles, Calif. 90068

Filed Jul. 21, 1977, Ser. No. 817,708

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—687 **33 Claims**



1. A method of detecting and diagnosing abnormalities in body tissue utilizing cardiokymographic techniques, said method comprising:

(a) positioning a detector close to the tissue of a person being tested and over a selected segment of said tissue,

(b) passing current through said detector to generate an electric field such that the generated electric field will be close to the surface of the person being tested,

(c) sensing a change in capacitance in the electric field generated close to the surface of the person being tested as a result of tissue movement and providing a signal at least partially representative of said tissue by the capacitive change in said electric field,

(d) processing the signal representative of said tissue movement and separating the signal into a low frequency signal component representative of tissue movement and a high frequency signal component representative of an audible manifestation of the tissue movement,

(e) depicting the low frequency signal component to represent the tissue movement and depicting the high frequency signal component to providing timing with respect to the tissue movement, and

(f) and analyzing said depicted portion of said signal components to determine any abnormality in the tissue movement.

4,182,316

HOLOGRAPHIC INSTALLATION

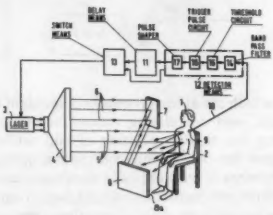
Kenth Nilsson, Akersberga; Bertil Höek, Upsala; Thomas Ohlsson, Vällingby, and Hans Bjelkhagen, Stockholm, all of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 844,909

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1976, 2648282

Int. Cl.[2] A61B *5/10*

U.S. Cl. 128—665 **2 Claims**



1. In a holographic system for recording movements of a body surface of a patient, said system including a source of coherent light for projecting light on a body surface to create an object wave and having means for creating a reference wave, a film carrier for photographic film disposed to simultaneously record the object and reference waves to form a hologram thereof, and switch means for double pulse switching of said source at predetermined intervals so that two separate holograms of the body surface are recorded with each hologram being at a different time interval of the movement of the body surface, the improvements comprising transmitter means for sensing cardiac activity of the patient and creating a signal to activate said switch means, said transmitter means including means for determining an EKG of the patient and signal processing means for activating said switch means at a predetermined interval of an EKG cycle, said signal processing means being connected to said means for determining an EKG.

4,182,317

OBJECT DISLODGING METHOD AND APPARATUS

Paul M. Ash, 33 E. Tilden Dr., Brownsburg, Ind. 46112

Continuation-in-part of Ser. No. 741,786, Nov. 15, 1976, abandoned. This application Dec. 14, 1977, Ser. No. 860,450

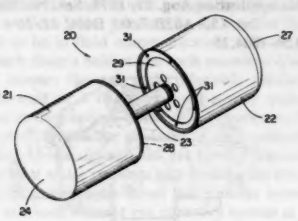
Int. Cl.[2] A61H *31/00*

U.S. Cl. 128—28 **14 Claims**

1. An object dislodging apparatus for objects stuck in a throat which comprises:

a dumbbell-shaped member having an enlarged portion at one end and a similarly shaped enlarged portion at the opposite end, said enlarged portions being joined together by a connecting member;

each of said enlarged portions having a generally circular outer end shape and a diameter size sufficient to avoid rib cage interference when placed against the user's abdomen at a location directly beneath the user's diaghragm; and



said apparatus having an overall length such that with one of said enlarged portions positioned against said abdomen and substantially perpendicular thereto, the hands of said user are able to be clasped together over the outermost end of the other enlarged portion.

4,182,318

METHOD AND BRACE FOR TREATING EPICONDYLITIS

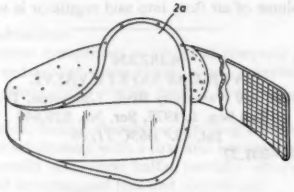
Günter Beige, and Horst Braunberger, both of Bahnhofstrasse 49, 6680 Neunkirchen, Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 784,449

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635426

Int. Cl.[2] A61F *5/01, 13/10*

U.S. Cl. 128—77 **8 Claims**



1. A brace for treating an arm afflicted with epicondylitis comprising a resilient U-shaped spring band having opposite end portions forming two opposed jaws, one of said jaws having a pressing surface engageable with the medial aspect of the elbow region of the arm and the other of said jaws having a pressing surface engageable with the lateral aspect of the elbow region of the arm, said clamp further having a bow portion connecting said jaws the major part of which bow portion is of a size and shape to be spaced from the arm when said pressing surfaces of said jaws are in engagement, respectively, with the lateral and medial aspects of the arm elbow region, said pressing surfaces of said jaws normally being spaced apart a distance less than the distance between the lateral and medial aspects of the arm elbow region but being spreadable for engagement with such aspects for applying substantial pressure thereon due to the resiliency of said spring band for applying pressure on the arm muscles and their associated tendons to change the pulling directions of such muscles and tendons.

4,182,319

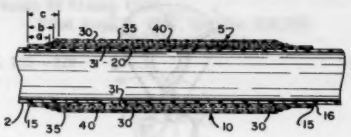
SURGICAL SPLINT

Arnett P. Scott, 4829 Fountain Ave., St. Louis, Mo. 63113

Filed Sep. 5, 1978, Ser. No. 939,477

Int. Cl.[2] A61F *5/00*

U.S. Cl. 128—79 **10 Claims**



1. A penial appliance comprising identical, oppositely disposed, longitudinal support members facing surfaces of which are a surface of a continuous, thin, elastic web of uniform thickness, an outer layer coextensive with, overlying and bonded in its contiguous areas to said web, said bonded web and outer layer extending, at the ends of said support members, between said support members, forming connecting elastic bands integral with said support members, an envelope in each member including a web sheet of woven fabric and a smaller outer sheet of woven fabric, sandwiched between said web and said outer layer, extending lengthwise of each member intermediate but short of the ends and sides of said web and outer layer, and a stay, within said envelope.

4,182,320

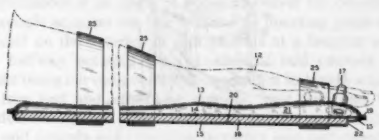
DISPOSABLE PROTECTIVE SLEEVE, HAVING A PNEUMATIC ACTION, FOR A RIGID SPLINT BOARD OR THE LIKE

Kevin M. Sweeney, Woodstock, N.Y., assignor to Simulaids, Inc., Woodstock, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,606

Int. Cl.[2] A61F *5/04*

U.S. Cl. 128—89 R **6 Claims**



1. A foldable, disposable, inflatable protective sleeve for use in association with a re-usable, rigid splint board, which comprises

(a) three rectangular sheets of thermoplastic material each being formed to be slightly in excess of the rigid splint board width and length dimensions and being arranged and configured in juxtaposed layers comprising two outer sheets and one intermediate sheet,

(b) fastening means to form an air-tight seal between the three juxtaposed sheets at the peripheral portions thereof,

(c) a first expansible pocket defined by the air-tight seal, one of said outer sheets and the intermediate sheet,

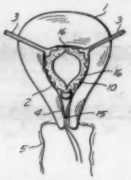
(d) a second expansible pocket defined by the air-tight seal, the other of said outer sheets and the intermediate sheet,

(e) an access slot being formed in said first pocket,

(f) said rigid splint board being insertable into the first pocket through said access slot, and

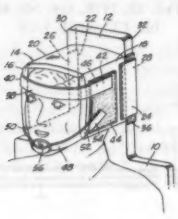
(g) selectively operable valve means associated with said second pocket whereby pressure fluid may be admitted to said second pocket, thereby inflating the second pocket to provide a yieldable, pillow-like supporting surface over the inserted rigid splint board.

4,182,321
INTRA-UTERINE CONTRACEPTIVE DEVICE
Laszlo K. Csatary, 1913 Windsor Rd., Alexandria, Va. 22307
Filed Nov. 28, 1977, Ser. No. 855,415
Int. Cl.[2] A61F 5/46
U.S. Cl. 128—130 **8 Claims**



1. An intra-uterine contraceptive device comprising an inner base ring made from a resilient material and formed into a generally circular shape, and a substantially homogeneous jelly-like material formed on said inner ring into a plurality of bead-like protrusions, said protrusions being disposed over the circumferential length of said inner ring.

4,182,322
HEAD HARNESS DEVICE
Larry C. Miller, 465 Olivetta Pl., La Canada, Calif. 91011
Filed Aug. 4, 1978, Ser. No. 931,168
Int. Cl.[2] A61F 13/00
U.S. Cl. 128—133 **9 Claims**



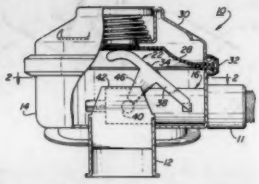
1. An improved head harness device, for use with a body splint/litter apparatus having a head-rest section at one end thereof, said head harness device comprising:

(a) protective means for cushioning the head of an accident victim and for restraining lateral motion of the accident victim's head, said protective means having a plurality of cushion pads foldably connected together for ease of placement over the top and left and right sides of the head of said victim;

(b) securing means, in cooperative association with said protective means, for removably securing said protective means to the head-rest section of the body splint/litter apparatus; and

(c) restraining means, in cooperative association with said protective means, for restraining forward motion of the head of an accident victim who has been placed upon the body splint/litter apparatus, whereby the accident victim's head is restrained against injurious motion and is protectively cushioned from external forces while being transported after being placed on the body splint/litter apparatus.

4,182,323
BREATHING APPARATUS
Vernon G. Pedersen, Chicago, Ill., assignor to Dacor Corporation, Northfield, Ill.
Division of Ser. No. 830,588, Sep. 6, 1977, Pat. No. 4,140,113.
This application Aug. 21, 1978, Ser. No. 935,089
Int. Cl.[2] A62B 7/00; B63C 11/16
U.S. Cl. 128—204.25 **3 Claims**



1. A method of controlling the venturi action in a breathing regulator, comprising:

automatically increasing the supply of air from a pressurized source into an air chamber in said regulator in response to inhalation, and automatically decreasing said supply into said air chamber in response to exhalation,

directing said air from said air chamber into a breathing port opening into said air chamber,

creating a jet stream inside said air chamber from said pressurized source and directing said jet stream into said breathing port to reduce the pressure in said air chamber as a result of a venturi action caused by said jet stream into said breathing port,

maintaining said venture action substantially constant by automatically and gradually reducing said jet stream as the supply of air is increased during inhalation and increasing said jet stream as the supply of air is decreased during exhalation,

whereby the venturi action is maintained substantially constant by varying the ratio of the amount of air supplied as said jet stream to the breathing port to the amount of air supplied to said breathing port from said air chamber as the volume of air flow into said regulator is varied.

4,182,324
DIVER GAS SAFETY VALVE
Brian A. Hills, 200 University Blvd., Galveston, Tex. 77550
Filed Sep. 1, 1977, Ser. No. 829,643
Int. Cl.[2] B63C 11/14
U.S. Cl. 128—201.27 **6 Claims**

1. In a diving system including a diver's helmet and an exhaust gas recovery system for transferring exhaust gas from such diver's helmet to such exhaust gas recovery system, the improvement comprising a diver gas safety valve adapted for attachment between such diver's helmet and such exhaust gas recovery system to allow for the safe transfer of diver exhaust gas therebetween, comprising:

a hollow, flacid collapsible tubular element having first and

second ends a hollow interior portion and an exterior adapted for exposure to ambient water pressure;

attachment means for attaching said first end of said collapsible tubular element to such diver's helmet and said second end thereof to such exhaust gas recovery system; and

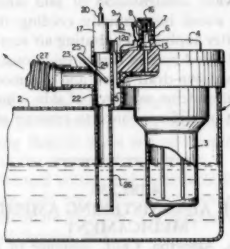
said collapsible tubular element being adapted to be exposed to such ambient water pressure on the exterior thereof and adapted to be in fluid communication with such exhaust gas in such diver's helmet and such recovery system in the hollow interior thereof, said collapsible tubular element being formed of a flacid material totally collapsible in response to the pressure differential between such ambient water pressure and the pressure of such exhaust gas for expanding to transfer exhaust gas having pressure greater than ambient water pressure surrounding the diver and for collapsing to prevent exhaust gas transfer between such helmet and such exhaust gas recovery system at pressures of such exhaust gas below the ambient water pressure thereby preventing a dangerous outflow of exhaust gas from such diver's helmet.

4,182,325

STEAM-AIR INHALATOR

Nat Camp, 912 Sunset Ave., Gettysburg, Pa. 17325

Filed Jan. 10, 1978, Ser. No. 868,569
Int. Cl.[2] A61M *15/00*
U.S. Cl. 128—203.27 **10 Claims**



1. In combination:

a. a vaporizer comprising an enclosed reservoir containing water and having a top cover, steam generating means, and a steam outlet nozzle leading from said generating means,

b. a steam-air mixing chamber comprising a housing having an internal channel with a first and a second end,

c. a generally transverse baffle partially obstructing said channel between said first and second ends,

d. said steam nozzle removably fitted into said first end of said housing and having an outlet orifice directed towards said channel to direct a steam jet onto said baffle,

e. said housing having entrance means for ambient air in the vicinity of the baffle, whereby ambient air can enter into said channel, and whereby the steam is deflected by said baffle, and entrains and mixes with the ambient air to form a superfine mist,

f. venturi inlet means in said housing near said second end thereof and connected to a source of pressurized gas,

g. said second end of said housing defining a tubular means said inlet means axially aligned with said tubular means at said second end of said housing and passing pressurized gas into said tubular means,

h. said tubular means communicating with said channel,

i. a tubular fitting having two ends and a lateral arm in communication therewith, said tubular fitting removably connected at one end to said tubular means,

j. whereby a warm mixture of superfine mist and gas enters said lateral arm from said tubular means,

k. breathing means connected to said lateral arm,

l. and the other end of said tubular fitting passing through said reservoir top cover.

4,182,326

LARYNGOTRACHEAL SYRINGE

Robert W. Ogle, Newport Beach, Calif., assignor to IMS Limited, South El Monte, Calif.

Filed Aug. 26, 1977, Ser. No. 828,248
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—220 **1 Claim**

1. A medicament injector for laryngotracheal anesthesia comprising a cylindrical vial having an open end and a closed end, a resilient plug inserted at least partially through said open end engaging the walls of said vial with a press fit, a cylindrical member having one closed end and surrounded by an outside barrel coextensive in length with said cylindrical member, a self-sustaining flexible and elongated cannula secured to and extending outwardly from said cylindrical member with a series of uniformly spaced fluid discharge holes disposed radially thereabout at an angle of about 120° over the one-half of the cannula adjacent the free end and an inserting guide mark provided on the exterior of said cannula at a location essentially halfway between the two ends of said cannula, said cannula being curved over about one-half of its length adjacent said free end and otherwise straight, said free end being rounded and closed, a thin long fluid passage communicating with said cannula and extending inwardly into said cylindrical member with a sharpened inner end, cooperating threaded interlocking means on said cylindrical member and said plug, whereby upon interlocking said plug with said cylindrical member said vial is first held in an assembled but non-operating position and upon further interlocking of said plug with said cylindrical member said plug is pierced by said elongated fluid passage and said passage communicates with said vial and said plug is locked securely to said cylindrical member to permit aspiration upon withdrawal of said vial, and to permit expulsion of the contents of said vial through said discharge holes in an essentially 360° array upon exertion of pressure on said vial.

4,182,327

APPARATUS FOR ADMINISTERING DRUGS TO ANIMALS

Henry C. Haley, P.O. Box 55, Calumet, Okla. 73014

Filed Feb. 1, 1978, Ser. No. 874,137
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—215 **5 Claims**

1. An apparatus for administering drugs to animals which comprises:

bow means for propelling an arrow;

an arrow having a forward end and a rearward end;

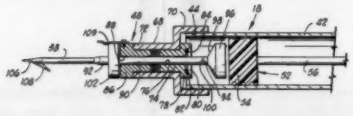
a reel having a length of cord wound thereon attached to said bow means, the free end of said cord being attached to said arrow whereby said arrow can be retrieved after being propelled by reeling in said cord; and

drug dispensing means attached to the forward end of said arrow comprising:

a hollow tube having a forward end and a rearward end, the rearward end of said tube being attached to said arrow;

a plunger sealingly disposed within said tube;

means for moving said plunger to the rearward end of said tube attached thereto;



means for constantly urging said plunger towards the forward end of said tube attached thereto;

a hypodermic needle attached to the forward end of said tube; and

impact valve means attached to said hypodermic needle and to said tube for closing the forward end of said tube until said needle strikes an animal whereupon said valve means are opened and a drug contained within said tube is injected into said animal by way of said hypodermic needle.

4,182,328

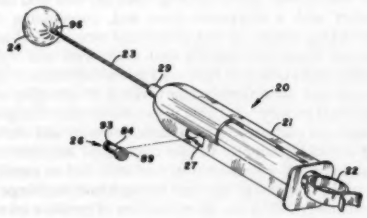
DISPENSING INSTRUMENT AND METHOD

Lee R. Bolduc, Clearwater, Fla., and Eugene A. Dickhudt, New Brighton, Minn., assignors to Population Research Incorporated, Clearwater, Fla.

Filed Nov. 23, 1977, Ser. No. 854,081

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—235 **35 Claims**



1. An instrument for placing material into both canals of the Fallopian tubes of a female comprising: an expandable member positionable in the uterine cavity, dispensing means positionable in the uterine cavity for supporting said expandable member and for dispensing material between said expandable member and the walls of the uterine cavity; and means for collapsing said expandable member against said dispensing means before introduction of the expandable member through the cervical opening into the uterine cavity and for expanding the expandable member in the uterine cavity to move material from the uterine cavity to the canals of the Fallopian tubes.

4,182,329

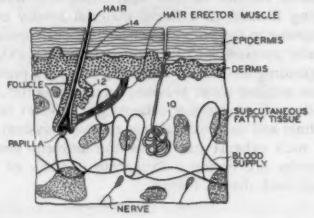
ACNE FACIAL TREATMENT APPLIANCE AND METHOD

Helen E. Smit, and Julie A. Smit, both of 1045 Hinman Ave., Evanston, Ill. 60202

Filed May 31, 1977, Ser. No. 801,850

Int. Cl.[2] A61F *7/00*

U.S. Cl. 128—256 **17 Claims**



1. A personal appliance comprising a housing including means for heating fluids to a steam heat, means for conveying said steam by convection currents directly to an area of skin surface for a predetermined period, valve means for preventing the steam-moistened air from being mixed with and cooled by room air during the conveying of said steam-moistened air to the skin to prevent condensation of said steam into water droplets and to avoid intentionally cooling the steam, and means for thereafter applying a pulsating air suction to the area of skin which is heated by said steam, said housing including a combination of a down-draft hood and a removable tray for catching debris lifted from said area of skin whereby said tray may be lifted out of said appliance to remove said debris and sanitize said tray.

4,182,330

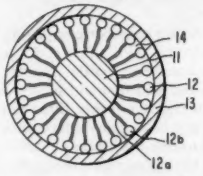
MEANS FOR ADMINISTERING AMPHIPATHIC MEDICAMENT

Alan S. Michaels, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Jul. 25, 1977, Ser. No. 818,292

Int. Cl.[2] A61M *37/00*

U.S. Cl. 128—260 **9 Claims**



1. An osmotic therapeutic system for the controlled dispensing of drug to a biological environment of use, said system comprising:

(a) a shaped wall formed of a non-toxic semipermeable material that maintains its integrity during the drug dispensing period and which material is permeable to the passage of an external fluid in the environment and substantially impermeable to the passage of drug, the wall surrounding and forming;

(b) a compartment;

(c) a micelle comprising an amphipathic drug pharmaceutically acceptable surfactant adduct which adduct is coated onto an osmotically effective solute that exhibits an osmotic pressure gradient across the wall against the fluid housed in the compartment;

(d) a passageway in the wall communicating with the compartment and the exterior of the system, and;

(e) wherein in operation when the system is in the environment, fluid from the environment is imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, thereby continuously forming a solution of adduct, which solution containing the drug is dispensed through the passageway at a controlled rate over a prolonged period of time.

4,182,331

ANIMAL SUPPOSITORY HOLDER

Rene Rodriguez, 8 Greenway North, Forest Hills, N.Y. 11376

Filed Mar. 31, 1978, Ser. No. 892,111

Int. Cl.[2] A01K *23/00*; A61F *15/00*

U.S. Cl. 128—271 **8 Claims**

1. A holder designed for facilitating the hygienic insertion of a suppository within the rectum of an animal, comprising:

a receptacle having flexible walls and an opening for communication with the rectum of an animal;

an enclosure positioned within said receptacle for retention of a suppository, said enclosure being smaller than said receptacle to facilitate location of a suppository, and attached to a wall thereof; and

a harness for securing the receptacle on the animal, said harness including means for securing the receptacle thereto.

4,182,332

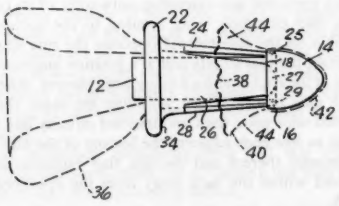
RECTAL CATHETER

Richard P. Delaney, 4323 Havard St., Silver Spring, Md. 20906

Filed Feb. 17, 1978, Ser. No. 878,726

Int. Cl.[2] A61F *5/44*

U.S. Cl. 128—283 **12 Claims**



1. A rectal catheter, which comprises:

bag means for collecting fecal matter comprising a continuous flexible material having an open end defined by a neck portion;

flexible means for retaining said neck portion of said bag means within the rectal opening of a patient; said flexible means including a cannula having a plurality of forwardly and outwardly projecting flexible and resilient flanges adapted to exert pressure on the inner wall of the rectum when inserted therein, each of said flanges including a tip; and

obturator means selectively coupled to said bag means and said flexible means for permitting insertion thereof into the rectal opening of said patient while said neck portion of said bag means is folded over the tips of said flanges so as to be retained against the inner wall of the rectum.

4,182,333

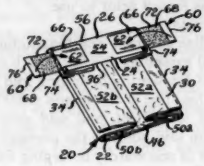
DISPOSABLE DIAPER WITH FASTENER RETAINED END BARRIER

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 10, 1977, Ser. No. 823,259

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—287 **10 Claims**



1. A disposable diaper, comprising:

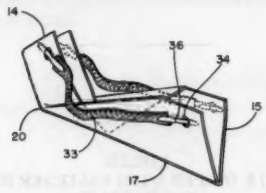
an absorbent pad assembly having an absorbent pad, a front surface, a back surface, a pair of side edges, a pair of end edges connecting the side edges, a plurality of longitudinally extending folds defining a box-pleat configuration of the pad assembly having a pair of first fold lines defining a longitudinally extending central panel, and a pair of second fold lines defining a pair of first pleat panels intermediate the first and second fold lines and overlying the central panel, and defining a pair of second pleat panels extending between the second fold lines and said side edges, said pad assembly having a lateral fold of the box-pleat assembly along a fold line spaced slightly from one of said end edges and defining an end section of the pad assembly intermediate said lateral fold line and said one end edge, with said end section being folded over the front surface of a portion of the pad assembly adjacent said lateral fold line; and

a tape fastener comprising release sheet means on the back surface of said end section central panel at a location adjacent a first fold line of the central panel and having a release surface facing outwardly from the back surface of said end section central panel, and a tape strip having a first inner section attached to a second pleat panel beneath the central panel of the folded over end section, and a second outer section extending around the side edge and over a portion of the back surface of said end section central panel and having an adhesive surface facing the back surface of said end section central panel and releasably attached to said release sheet means with said release surface facing outwardly from the back surface of the end section central panel.

4,182,334
PERINEAL SHIELD AND DISCHARGE CONTAINMENT DEVICE

Russell L. Johnson, Weyauwega, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 726,964, Sep. 27, 1976, Pat. No. 4,067,336. This application Dec. 5, 1977, Ser. No. 857,530
The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—287 30 Claims



1. A perineal shield and discharge containment device comprised of a sheet of flexible material in generally elongate form defined by a top body-contacting surface, a bottom surface, a front edge, a back edge and two side edges; said sheet being provided with a plurality of pre-established fold lines along which said sheet is folded prior to use;

said lines comprising:

(a) a main fold line centrally and longitudinally disposed on said sheet and extending the full length of said sheet,

(b) a first pair of rearwardly diverging fold lines originating on said main fold line at a common point spaced from the front edge of said sheet, and said diverging fold lines extending from said point to the perimeter of said sheet,

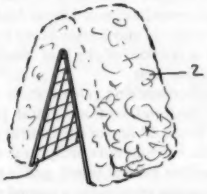
(c) a second pair of rearwardly diverging fold lines disposed between said first pair of diverging lines and the side edges of said sheet, said second pair of lines also originating at said point on said main fold line and extending from said point to the perimeter of said sheet;

said sheet being adapted for inward folding on said main fold line, inward folding on said first pair of rearwardly diverging fold lines, and outward folding on said second pair of rearwardly diverging fold lines.

4,182,335
ANAL FILTER

C. James Matrullo, 242 B Jefferson Ct., Lakewood, N.J. 08701

Filed Jul. 27, 1977, Ser. No. 819,542
Int. Cl.[2] A61F *5/44*
U.S. Cl. 128—290 R 1 Claim

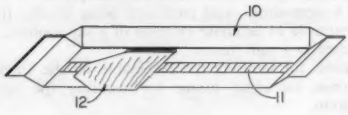


1. An anal filter for attachment to a person's anus and comprising a base layer of porous flexible material to which a fluffy non-woven fibrous layer is attached, said fibrous layer having an outer side attached to said material and an inward surface which is uncovered and exposed, said filter having a length sufficient to transversely extend over the anus and adjacent portions of the person's buttocks and having a width at least sufficient to cover the anus in a vertical direction, said filter being easily flexible under finger pressure so that the filter can be laid with the fibrous layer inward transversely between the buttocks and pressed inwardly by finger pressure so that, by bending, a generally central portion of said inward surface of the fibrous layer contacts the outside of the anus with the balance of said inward surface contacting the adjacent portions of the buttocks, said uncovered and exposed inward surface of said fibrous layer being fluffy to a degree holding the filter on the anus solely by adherence thereto and to said buttock portions without adhesives or insertion into the anus, said filter being pervious to the discharge of gas through the anus but substantially impervious to complete passage of excreta carried by the gas or remaining on the anus from a bowel movement prior to the attachment of the anal filter, and in which said fibrous layer is formed by individual fibers and a covering layer is adhesively fastened temporarily to the inward surface of the fibrous layer, said covering layer being adapted to be pulled free from said fibrous layer prior to use of the anal filter so that said fibers are pulled outwardly while said covering layer is pulled free from the fibrous layer, the inward surface of said fibrous layer being thereby made fluffy to said degree.

4,182,336
SANITARY NAPKIN WITH ATTACHED DISPOSAL CONTAINER

Charles A. Black, 777 S. Lawrence St., Montgomery, Ala. 36101

Continuation of Ser. No. 800,625, May 27, 1977, abandoned.
This application Jul. 10, 1978, Ser. No. 923,409
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—290 R 1 Claim



1. As an article of manufacture,

(a) a sanitary napkin having secured thereto a sack for disposing of the napkin,

(b) said sack being made of foldable, substantially moisture-proof material,

(c) said sack being generally triangular when in open position and as viewed in side elevation,

(d) there being a first flap extension on a rear wall of the sack at its open end and extending outwardly of its open end, said flap extension being secured to the surface of the napkin on the side thereof opposite the side disposed to contact the user's body and at a position intermediate one end of the napkin and a folding zone thereof, whereby the sack may be opened by unfolding the same, the napkin folded once upon itself and inserted directly into the sack with its free ends adjacent the bottom of the sack and the reaminder thereof and the first flap extension being received within the sack away from the open end of the sack,

(e) a second flap extension on said sack on the front wall thereof and adjacent the open end of the sack and adapted to reach across the open end of the sack to close the same, and

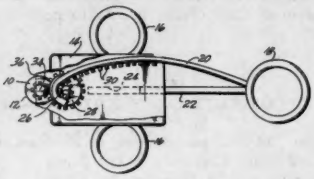
(f) means to secure the second flap to the rear wall of the sack, thus to close the sack with the napkin and the first flap in place therein.

4,182,337

SURGICAL INSTRUMENT FOR PERFORMING EMERGENCY TRACHEOTOMIES

Kenneth L. Nickson, 2180 Gainsborough Dr., Riverside, Calif. 92506

Filed Sep. 6, 1977, Ser. No. 830,848
Int. Cl.[2] A61B *17/32*
U.S. Cl. 128—305.3 21 Claims



1. A surgical instrument for performing emergency tracheotomies comprising an elongated rigid body; a cutter having a rounded blade edge rotatably secured to one end of the rigid body; blade-actuating means slidably secured to the body for rotating the cutter on its axis in response to sliding movement of the blade-actuating means relative to the body; an elongated groove formed in an undersurface of the rigid body, the groove being aligned longitudinally with the cutter; and a trachea tube adapted to slide in the groove toward and under the cutter.

4,182,338

PRESSURE APPLYING DEVICE

Nancy U. Stanulis, Marion, Va., assignor to Smyth County Dialysis Unit, Marion, Va.

Filed Dec. 29, 1977, Ser. No. 865,408
Int. Cl.[2] A61B *17/12*
U.S. Cl. 128—325 7 Claims

1. A device capable of applying localized pressure to a selected point on the body so as to prevent the loss of blood from the wound left by a needle puncture, without preventing sub-surface flow of blood, such device comprising:

a truncated pyramid-shaped appliance of an elastomeric material having a skin contacting surface and an attaching surface;

a blunt projection protruding from said skin contacting surface with such projection occupying less than the total area of said skin contacting surface;

attachment means associated with said attaching surface; and

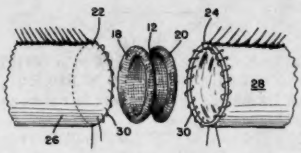
adjustable fastening means operatively associated with said attachment means, to adjustably secure the applicance in position over wounds in body members of varying sizes, so that said blunt projection blocks the flow of blood from the wound without blocking sub-surface flow of bood in such body member.

4,182,339

ANASTOMOTIC DEVICE AND METHOD

Thomas G. Hardy, Jr., 350 E. Broad St., Columbus, Ohio 43215

Filed May 17, 1978, Ser. No. 906,835
Int. Cl.[2] A61B *17/11*
U.S. Cl. 128—334 R 4 Claims



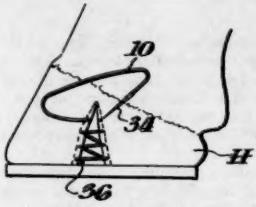
1. An anastomosis device for use in the surgical joining of the free ends of two tubular members to be anastomosed as the tubular members have portions retained in abutting relation upon said coupling device by purse string sutures, said anastomosis device comprising a pliable, unitary cylindrical sleeve having a central portion and first and second ends, each of which are rolled outwardly upon themselves toward the opposing ends to form a pair of relatively firm ring members in spaced relation upon said central portion, said cylindrical sleeve being of knit fabric, and having said spaced ring members coated with a rigidity promoting material, said knit fabric being at least partially formed of yarn made of dissolvable material, said ring members being spaced apart a prescribed distance for receiving therebetween the inturned free ends of the tubular members as they extend over the ring members from positions generally parallel with said central unrolled portion and retained in abutting relation generally perpendicular to said cylindrical sleeve central unrolled portion by purse string sutures enabling the two tubular members to grow together.

4,182,340

HOOF REPAIR

Dudley W. C. Spencer, 619 Shipley Rd., Wilmington, Del. 19809

Continuation-in-part of Ser. No. 762,394, Jan. 26, 1977, Pat. No. 4,116,278, which is a continuation-in-part of Ser. No. 614,766, Sep. 18, 1975, Pat. No. 4,013,126, which is a continuation-in-part of Ser. No. 426,446, Dec. 20, 1973, Pat. No. 3,917,000, which is a continuation-in-part of Ser. No. 71,121, Sep. 10, 1970, Pat. No. 3,664,428, and Ser. No. 252,546, May 12, 1972, Pat. No. 3,782,473. This application Sep. 21, 1977, Ser. No. 835,297
Int. Cl.[2] A01L *15/00*
U.S. Cl. 128—336 7 Claims



1. A method of treating a horse's hoof having a crack therein comprising the steps of cleaning the crack in preparation for treatment thereof, forming holes through the hoof along the periphery of the crack, inserting a hard pointed leader successively through the holes with the leader being integral with an elongated multifilament strand consisting of bulked filaments which is of open construction and having exposed air spaces therein and without the necessity of moistening the strand, continuing to insert the leader through the holes until the

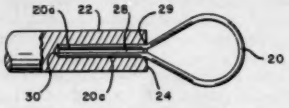
strand is threaded back and forth across the crack, securing the strand in place without the necessity of knotting the strand, applying to the crack an adhesive material capable when cured of being shod with nails with the adhesive material flowing into the exposed air spaces of the strand, said strand acting as a sponge to absorb the adhesive and to form an intimate bond therewith, and permitting the adhesive material to cure in situ in the crack.

4,182,341

EYED NEEDLE CONVERTED FROM A DRILLED END OR CHANNEL END NEEDLE

Santo Perri, Danbury, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 5, 1977, Ser. No. 839,689
Int. Cl.[2] A61B *17/06*
U.S. Cl. 128—339 **8 Claims**



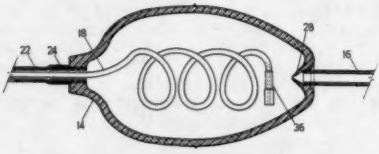
1. An eyed needle which has a large threading target comprising: a pointed end; a butt end; a hole or channel bored into said butt end along the length of said needle; a loop formed from a flexible polymer strand with the ends of said loop placed into said hole or channel; and attachment means for securing said ends in said hole or channel.

4,182,342

NASO-GASTRIC FEEDING DEVICE AND METHOD OF INSERTING SAME

Gordon E. Smith, Sun Prairie, Wis., assignor to Med-Pro, Ltd., Sun Prairie, Wis.

Filed Apr. 28, 1978, Ser. No. 900,914
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—348 **21 Claims**



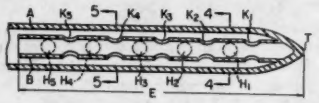
1. A naso-gastric feeding device comprising:
(a) a guide tube of semi-flexible material having a distal and a proximal end, the guide tube being adapted to be inserted through the nostril and into the stomach of a patient with the proximal end remaining outside the patient;
(b) a retainer formed inside of the guide tube near the distal end thereof;
(c) fluid pressure generating means connected to the proximal end of the guide tube for forcing fluids therethrough;
(d) a feeding tube of highly flexible material received within the guide tube and having a distal and a proximal end, the distal end having a feeding opening formed in its wall surface;
(e) an enlarged portion of the feeding tube formed at its proximal end; and
(f) an anchor attached to the distal end of the feeding tube, the anchor being formed of flexible material having a metallic component included therein, the anchor being initially secured on the distal end of the guide tube and being removable therefrom while positioned within the patient by air forced through the guide tube by the fluid pressure generating means;
(g) the feeding tube being removable from the guide tube into the stomach and intestinal track by liquid forced through the retainer and distal end of the guide tube by the fluid generating means until the feeding tube enlarged portion engages the retainer and is retained thereby within the guide tube, the proximal end of the feeding tube being removable from the patient by withdrawal of the guide tube with the distal end of the feeding tube remaining in the intestinal tract of the patient to deliver nutrients thereto.

4,182,343

DOUBLE COELIAC DRAINAGE TUBE MADE OF SILICONE

Yutaka Inaba, Tokyo, Japan, assignor to President of Tokyo Medical and Dental University, Tokyo, Japan

Filed Sep. 26, 1977, Ser. No. 836,907
Claims priority, application Japan, Oct. 5, 1976, 51-118947
Int. Cl.[2] A61M *27/00*
U.S. Cl. 128—350 R **2 Claims**



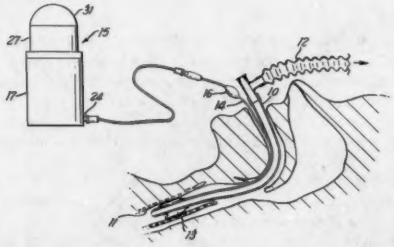
1. A double body cavity drain tube comprising:
an outer tube having one end closed and one end open, said outer tube having a plurality of openings therethrough; and
an inner tube shorter than said outer tube positioned within said outer tube and one end of said inner tube being connected to the inner wall of said outer tube at said closed end thereof, said inner tube further having a plurality of openings therethrough along a substantial portion of the length thereof, all of said openings in said inner tube being out of alignment with said openings in said outer tube.

4,182,344

PRESSURE CONTROL TRACHEAL DEVICE

Gerald B. Benson, Gt. Missenden, England, assignor to G. D. Searle & Co., Limited, High Wycombe, Bucks, England

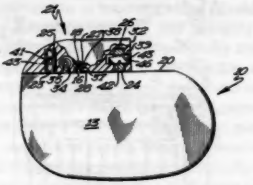
Filed Aug. 19, 1977, Ser. No. 825,879
Int. Cl.[2] A61M *25/00, 16/00*
U.S. Cl. 128—207.15 **8 Claims**



1. A pressure controlled tracheal device comprising in combination:
(a) a fluid reservoir having a variable volume and an outlet;
(b) a tracheal tube having a first end and a second end, said first end adapted for connection to a source of respiratory gas;

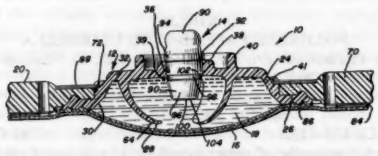
(c) an inflatable cuff in fluid communication with the outlet of said reservoir and attached around and adjacent to the second end of said tracheal tube;
(d) means for maintaining a constant fluid pressure in said reservoir; and
(e) warning means responsive to the volume of said reservoir and actuable when the volume of said reservoir reaches a predetermined value.

4,182,345
BODY IMPLANTABLE SIGNAL GENERATOR ASSEMBLY
Gary M. Grose, Brooklyn Park, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Apr. 7, 1978, Ser. No. 894,359
Int. Cl.[2] A61N 1/36
U.S. Cl. 128—419 P **9 Claims**



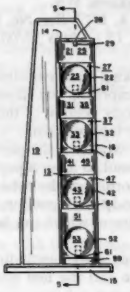
1. In a body implantable signal generator assembly of the type having signal generator means having a surface, preformed connector means and mechanical securement means securing said connector means to the surface of said generator means, the improvement wherein said mechanical securement means comprises:
means extending from said signal generator means surface, said extending means including keyway means;
aperture means within said preformed connector means configured to accept said extending means;
orifice means angularly intersecting said aperture means; and
key means inserted in said keyway means through said orifice means, said key means comprising wedge means for urging said connector means toward said generator means surface with the degree of urging being in accordance with the depth of insertion of said key means within said keyway means.

4,182,346
ELECTRODE
Kenneth C. Allison, Crystal Lake, Ill., assignor to Biomedical International Company, River Grove, Ill.
Filed Jun. 2, 1977, Ser. No. 802,715
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—641 **4 Claims**



1. A biomedical electrode for use on a subject comprising: a container having an open side; an electrolyte in the container; a terminal mounted in engagement with the container extending exteriorally therefrom and being in electrical connection with the electrolyte; a substantially rigid lock ring secured to said container; an electrode mount secured to said container by the lock ring adjacent to the open side of the container; said container has a circular cross-section and the electrode mount is annular, said lock ring is an annular circular lock ring which engages said electrode mount, and an annular ring lock bead formed in said container, said ring lock bead engaging the lock ring and having an outer diameter slightly greater than the inner diameter of the lock ring to lock the lock ring into position.

4,182,347
AIR INHALATION FLOW RATE MEASURING DEVICE
Ronald D. Russo, 111 S. Barranca St., Apt. 327, West Covina, Calif. 91791
Filed Feb. 27, 1978, Ser. No. 881,396
Int. Cl.[2] A61B 5/08
U.S. Cl. 128—725 **13 Claims**



1. An improved inhalation flow rate measuring device comprising
a vertical air flow column defined by a series of column segments having cross-sectional dimensions which are uniform along at least a lower portion of the length of each of said column segments,
means for inhaling air up through said column, and
an air flotation element moveably disposed in each of said column segments, at least one stop member projecting from the sidewall adjacent the lower end of the lower portion of each column segment whereby each of said elements initially reside within the lower portion of said column segment and each of said elements being separately raiseable within its column segment,
each of said elements being sized to fit within the uniform portion of the column segments with a relatively small gap disposed between said element and the interior wall of the uniform portion of said column segments whereby said element will rise within said column segment when the inhalation air flow rate through said gap is sufficient to raise said element,
means associated with each of said column segments to permit the freeflow of air therethrough after said inhalation air flow rate through each of said segments has been exceeded, said free flowrate through each of said sections being greater than the maximum flow rate registerable by said device,
each flotation element in each column segment having a different gap associated therewith whereby each of said elements is raisable by a different inhalation air flow rate through said column.

4,182,348
REMOVAL OF NITRIC OXIDE AND CARBON MONOXIDE FROM TOBACCO SMOKE

Friedlieb Seehofer, Pinneberg, and Erwin Kausch, Buchholz, both of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 938,004

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1977, 2740011

Int. Cl.[2] **A24B** *15/00;* **B01D** *53/34;* **A24B** *15/027*

U.S. Cl. 131—10 R **13 Claims**

1. A method for the catalytic removal of nitric oxide and carbon monoxide from tobacco smoke which comprises contacting said smoke with a compound of the formula

$$M_2M'RuO_6$$

wherein M is a divalent metal, M′ is a trivalent rare earth metal, and Ru has a valence of 5, M and M′ being such that their ions are capable of forming a perovskite lattice with the Ru ions.

4,182,349
METHOD OF MAKING RECONSTITUTED TOBACCO

William A. Selke, Stockbridge, Mass., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 4, 1977, Ser. No. 848,431

Int. Cl.[2] **A01D** *27/00*

U.S. Cl. 131—140 C **7 Claims**

1. A method of making reconstituted tobacco from the whole tobacco plant comprising the steps of:

(a) separating the woody portion of the tobacco plant stalk from the leaf of the tobacco plant,

(b) refining only the woody stalk portion to reduce it to pieces which can bond to form a paper-like sheet,

(c) refining the leaf portion of the tobacco plant to a lesser extent than the woody stalk portion is refined to reduce the leaf portion to pieces which can bond to form a paper-like sheet, and

(d) making an aqueous slurry including both the refined woody stalk portion and the leaf portion and forming a paper-like reconstituted tobacco sheet from the slurry using a conventional papermaking technique.

4,182,350
CIGARETTE FILTER

Peter Steinau, Mainz, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 26, 1977, Ser. No. 800,917

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623844

Int. Cl.[2] **A24B** *15/02;* **B01D** *29/08*

U.S. Cl. 131—269 **18 Claims**

1. A cigarette filter which has been produced by flash evaporation of a pressurized, superheated emulsion of

(a) a solution of a polyolefin in a low-boiling solvent, and

(b) an aqueous solution of from 0.05 to 0.7% by weight, relative to the polyolefin, of a hydrophilizing agent,

through a nozzle into a zone of low pressure and forming the product of said evaporation into a fibrous filter mass.

4,182,351
GENTLE CYCLE VALVE FOR DIGITAL DISHWASHER

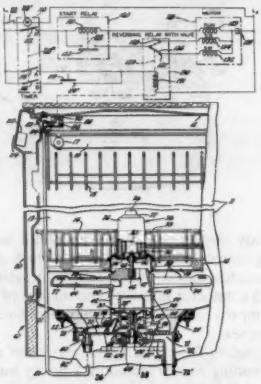
Homer W. Deaton, Bellbrook, and James A. Bright, Dayton, both of Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Dec. 4, 1978, Ser. No. 966,384

Int. Cl.[2] **B08B** *3/02*

U.S. Cl. 134—58 D **3 Claims**

1. In a fluid distribution system for a dish washing chamber, means for distributing washing fluid during a regular wash at a predetermined impinging force on dishes and the like in said chamber, a motor controllable for actuating such fluid distributing means to provide said predetermined impinging force and having wash and drain modes of operation in accordance with the operational direction of the motor, valve means controllable for supplying air to said fluid distributing means during actuation thereof to reduce the predetermined impinging force of washing fluid on the dishes and the like to provide a gentle wash, and control means for selectively controlling said motor and said valve means to provide said regular wash and said gentle wash, said control means comprising a reversing relay having a reversing switch for controlling the operational direction of said motor, an armature for moving said reversing switch and direction selector means adapted for interconnecting a power source and said reversing relay for moving said armature, a current sensitive start relay having a coil adapted for interconnecting a power source and said motor during its wash and drain modes of operation and a start switch closable



electromagnetically when said coil is energized in one manner for conditioning said reversing switch to select the operational direction of the motor and normally openable after a predetermined time interval when said coil is energized in another manner, and gentle wash selector means in shunt relation to said direction selector means and adapted for interconnecting a power source and said reversing relay for moving said armature to select said gentle wash after said predetermined time interval, the armature of said reversing relay being connected to said valve means and movable electromagnatically to open said valve means for supplying air to provide the reduced impinging force of washing fluids and, thus, said gentle wash, the armature of said reversing relay continuing to maintain said valve means open irrespective of said direction selector means, thereby to provide said reduced impinging force throughout said gentle wash.

4,182,352
FOLDABLE PAPERBOARD UMBRELLA

Terry Hermanson, c/o Mr. Christmas Inc., 41 Madison Ave., New York, N.Y. 10010

Filed Oct. 24, 1978, Ser. No. 954,153

Int. Cl.[2] **A45B** *19/00, 13/00*

U.S. Cl. 135—19.5 **11 Claims**

1. An umbrella of paper board or like material which in erected condition comprises in combination:

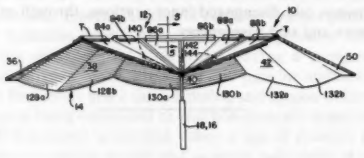
(a) a plurality of radially inwardly disposed panels;

(b) a plurality of radially outwardly disposed panels;

(c) a first operating unit; and

(d) a second operating unit; wherein said radially inwardly disposed panels are all generally in the form of isosceles triangles arranged in side-by-side relationship with the bases forming a theorethical circumscribing circle and the opposite vertices at the center of such circle, said in-

wardly disposed panels include a first main panel and a second main panel situated in a position diametrically opposed to said first main panel, a first series of secondary panels extending in a clockwise direction from said first main panel to said second main panel, a second series of secondary panels extending in a counterclockwise direction from said first main panel to said second main panel, said first and second main panels each being foldably connected to adjacent ones of said secondary panels on opposite sides thereof, each of said secondary panels being bisected into substantially right triangular sections by a hinge extending from the vertex at the center of the center of the theorethical circle to the base opposite therefrom, each of said secondary panels being foldable along the respective hinge thereof whereby the substantially right triangular sections may be brought together to close said umbrella, each of said secondary panels further being foldably connected to at least one other of said secondary panels along a further fold line; said plurality of radially outwardly disposed panels being generally trapezoidal in form, arranged in side-by-side relationship and having radially inwardly disposed minor bases and radially outwardly disposed major bases, one of said generally trapezoidal panels being a first main trapezoidal panel, another one of said trapezoidal panels being a second main trapezoidal panel situated in a position diametrically opposed to said first main trapezoidal panel, a first series of secondary trapezoidal panels extending in a clockwise direction from said first main trapezoidal panel to said second main trapezoidal panel, a second series of secondary trapezoidal



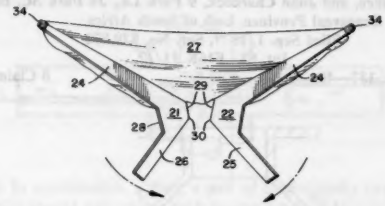
panels extending in a counterclockwise direction from said first main trapezoidal panel to said second trapezoidal panel, said first and second main trapezoidal panels being foldably connected along the minor bases thereof to said first and second main triangular panels along the respective bases of said first and second main triangular panels, said secondary trapezoidal panels each being foldably connected along the respective minor base thereof to one of said secondary triangular panels along the bases of such secondary triangular panels, each of said secondary trapezoidal panels being bisected into further trapezoidal sections by a fold line extending from the minor base to the major base thereof and extended generally from the vertex of the radially inwardly disposed secondary triangular panel foldably connected thereto whereby said further trapezoidal sections may be brought together when said umbrella is closed, said first and second main trapezoidal panels each being connected on opposite sides thereof to adjacent ones of said secondary trapezoidal panels, said secondary trapezoidal panels further being foldably connected to at least one other secondary trapezoidal panel; said first operating unit comprising support portions and handle portions extending from said support portions at right angles thereto at elbow portions, said support portions being secured to the underside of said first series of secondary triangular panels; and said second operating unit comprising support portions secured to the underside of said second series of secondary triangular panels and also having handle portions extending at right angles therefrom at elbow portions thereof.

4,182,353

STRETCHABLE PLASTIC FILM UMBRELLA

Terry Hermanson, c/o Mr. Christmas Inc., 41 Madison Ave., New York, N.Y. 10010

Filed Oct. 24, 1978, Ser. No. 954,154
Int. Cl.[2] A45B *15/00, 23/00, 11/00*
U.S. Cl. 135—19.5 **1 Claim**



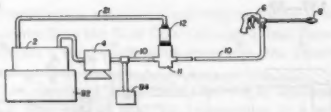
1. An umbrella comprising a combined handle and canopy support structure including four generally boomerang-shaped elements and an elastic and stretchable film canopy, two of said boomerang-shaped elements being hingedly connected to form a first set and two more of said boomerang-shaped elements being hingedly connected to form a second set, each of said boomerang-shaped elements including a canopy supporting boom portion and a handle portion, said two hinged connections being located along said handle portions, said canopy being secured to at least a portion of each of the four boom portions, said handle portions of the first set being in pressure contact with the handle portions of the second set under the influence of the tension forces in the canopy which is stretched when the umbrella is in open position with the boom portions angularly spaced from each other, three of the handle portions are identical and a fourth handle portion has a projecting margin which interfits with the V-shaped channel-like groove formed in the mating area of the first two hinged handle portions.

4,182,354

METHOD AND APPARATUS FOR FLOW DIVERSION IN A HIGH PRESSURE FLUID DELIVERY SYSTEM

Donald C. Bergstedt, Petaluma, Calif., assignor to U.S. Para-Plate Corporation, Sunnyvale, Calif.

Filed May 2, 1978, Ser. No. 902,148
Int. Cl.[2] F16K *31/363*
U.S. Cl. 137—10 **29 Claims**



1. A method of operating a fluid delivery system employing a pump, a closable discharge, and a bypass, the system being operable in a discharge phase during which fluid is discharged at relatively high pressure, and a bypass phase during which fluid is diverted at generally reduced pressure through a bypass, and wherein fluid flows past a movable bypass blocking means having at least two working surfaces of different areas, the method comprising the steps:

during the discharge phase opening the discharge and directing the flow of fluid to communicate with said working surfaces, whereby the bypass blocking means is held in the bypass blocking position; and

during the bypass phase closing the discharge, interrupting communication between the flow of fluid and the larger working surface, and reducing the fluid pressure on the

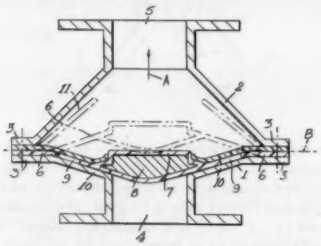
larger working surface whereby the bypass blocking means moves to the bypass open position.

4,182,355

REFLUX VALVE

Adriaan Z. A. Briel, 15 Curtis St., Rynfield, Benoni, Transvaal Province, and John Charnock, 9 Park La., 34 Park St., Benoni, Transvaal Province, both of South Africa

Filed Sep. 1, 1977, Ser. No. 829,871
Int. Cl.[2] F16K *31/12*
U.S. Cl. 137—496 **8 Claims**



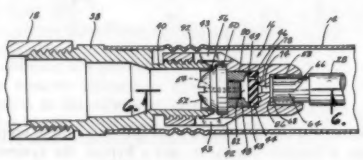
1. A reflux valve comprising a body having a passage communicating between an inlet and an outlet to the body, a movable valve seat in the passage wherein the valve seat has the form of a resiliently deformable diaphragm having an edge mounted to the body and having at least one perforation therethrough defining a flow path through the diaphragm, from the inlet to the outlet and wherein said perforation is offset from the centre of the diaphragm so as to provide a closed central area to said diaphragm to form a flow-blocking portion in co-action with said body, first closure means in the form of a flexible edge-mounted annular flap means positioned adjacent to and on the outlet side to co-operate with the diaphragm to define with the perforations through the diaphragm a non-return valve arrangement therewith the diaphragm and flap means being movable to a limited extent in the passageway against the bias of the inherent resilience of the diaphragm.

4,182,356

SILL COCK ASSEMBLY

Joseph C. Woodford, Sr., Spring Lake, Mich., assignor to Woodford Manufacturing Company, Des Moines, Iowa

Filed Apr. 17, 1978, Ser. No. 896,804
Int. Cl.[2] F03B *7/10*; F16K *17/168*
U.S. Cl. 137—59 **8 Claims**



1. A sill cock assembly comprising,

a fluid flow inlet means,

a fluid outlet means,

a conduit means fluidly connecting said fluid inlet means and said fluid outlet means, said conduit means having inward and outward ends with said inward end connected to said inlet means and said outward end connected to said outlet means,

selectively operable valve means operationally connected to said inlet means and adapted to alternately open and close said inlet means and adapted to alternately permit and prevent fluid flow from said inlet means through said conduit means in an outwardly direction, and pressure relief means located adjacent said valve means to provide fluid communication from said conduit means, through said valve means to said inlet means in an inwardly direction at a predetermined fluid pressure when fluid pressure in said conduit means is greater than fluid pressure in said inlet means,

said pressure relef means comprising a passageway extending through said valve means from said conduit means to said inlet means and closure means operationally connected to said passageway,

said closure means preventing fluid flow in an outwardly direction through said passageway and allowing fluid flow in an inwardly direction through said passageway at said predetermined fluid pressure within said conduit means,

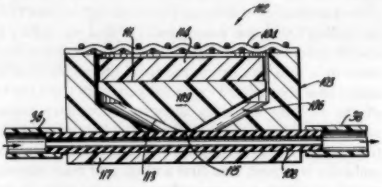
said closure means comprising a valve member seat within said passageway, said valve member seat including an annular inner portion and an annular outer portion positioned radially outwardly of said annular inner portion, and a valve member adjacent said valve member seat, said valve member having annular inner and outer portions adapted to engage said annular inner and outer portions respectively of said valve member seat to prevent fluid flow in an outwardly direction through said passageway, said valve member having an aperture therethrough at a position radially intermediate said inner and outer portions of said valve member so that said predetermined fluid pressure within said conduit means disengages said inner portion of said valve member from said inner portion of said valve member seat allowing fluid flow between said disengaged inner portions, through said aperture and said passageway.

4,182,357

METHOD OF CONTROLLING THE RELATIVE HUMIDITY IN A SOIL ENVIRONMENT AND APPARATUS FOR ACCOMPLISHING SAME

Leonard Ornstein, 5 Biltom Rd., White Plains, N.Y. 10607

Filed Mar. 2, 1978, Ser. No. 882,789
Int. Cl.[2] F16K *7/06*
U.S. Cl. 137—1 **13 Claims**



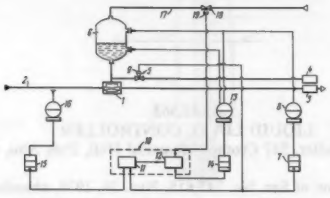
1. A method for regulating the flow of water to an environment in order to maintain the relative humidity in said environment at a preselected value which comprises sensing an increase or decrease in said environmental humidity relative to said preselected value by means of osmotic swelling or shrinking of a material capable of swelling no less than about 25 times its dry volume when in equilibrium with water at 100% relative humidity, wherein said swelling or shrinking obstructs or relieves, respectively, the flow of water to said environment thereby maintaining said relative humidity at the preselected value.

4,182,358

SYSTEM FOR LIMITING RATE OF PRESSURE RISE IN PIPELINE DURING HYDRAULIC IMPACT

Alexandr V. Sinelnikov; Raisa S. Patushinskaya; Lazar I. Freidgeim; Anatoly A. Bizev; Larisa M. Druzhkova; Vyacheslav K. Salimov, all of Moscow; Sergei P. Lebedich, Bugulma; Sergei L. Lvov, Moscow; Margarita E. Minkina, Moscow; Alexandr P. Shurygin, Moscow; Valery S. Levin, Moscow; Solmaz A. Faradzh-Zade, Moscow, all of U.S.S.R.; Igor V. Lebedev, deceased, late of Moscow, U.S.S.R. (by Anna S. Izbash, Marina I. Lebedeva, administrators), and by Marina I. Lebedeva, administrator, Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Komplexnoi Avtomatizatsii Neftyanoi I Gazovoi Promyshlennosti, Moscow, U.S.S.R.

Filed Jul. 12, 1976, Ser. No. 704,176
Int. Cl.[2] G05D *11/02*
U.S. Cl. 137—115 6 Claims



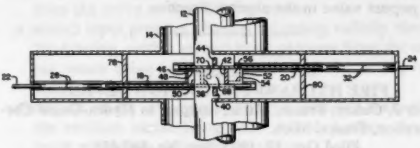
1. A system for limiting the rate of pressure rise in a pipeline during a hydraulic impact comprising a non-pressure dump tank; a first actuator controlled valve having a membrane drive; a jet valve installed directly in said pipeline and having an inlet, a first outlet and a second outlet, said second outlet of said jet valve being connected to said non-pressure dump tank via said first actuator controlled valve; a rate of pressure rise signal indicator having an inlet and an outlet, said outlet of said rate of pressure rise signal indicator being connected with said first actuator controlled valve; a first pressure transmitter having an inlet and an outlet, said outlet of said pressure transmitter being connected with said inlet of said rate of pressure rise indicator; and pressure-tight pneumatic compensator means for reducing the rate of the pressure rise in the pipeline by lifting therein the working fluid during the hydraulic impact and by compression of the air cushion in the compensator above the fluid level, said pressure-tight pneumatic compensator means being connected to said second outlet of said jet valve and, via said first pressure transmitter, to said rate of pressure rise indicator; a logical unit having inlets and an outlet; a first position regulator; a second position regulator; a second pressure transmitter installed in said pipeline and connected with said second position regulator; an air supply line having a second actuator controlled valve with a membrane drive, said pressure-tight pneumatic compensator means being connected with said air supply line through said second actuator controlled valve, said membrane drive of said second actuator controlled valve being connected with said outlet of said logical unit; a third pressure transmitter showing the fluid level in said pressure-tight pneumatic compensator means and having three outlets, two outlets of said third pressure transmitter being connected with said pressure-tight pneumatic compensator means and a third outlet of said third pressure transmitter being connected via said first position regulator with a first inlet of said logical unit; a second inlet of said logical unit being connected to said outlet of said rate of pressure rise signal indicator; a third inlet of said logical unit being connected via said second position regulator to said second pressure transmitter.

4,182,359

SLIDE GATE DAMPER

Earl K. Rickard, East Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 27, 1977, Ser. No. 864,416
Int. Cl.[2] F16K *3/316*
U.S. Cl. 137—246.22 7 Claims



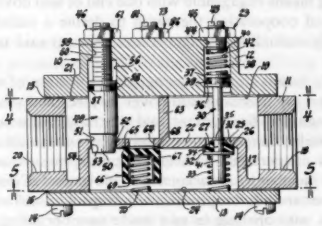
6. In combination, a duct, a pair of diametrically opposed, axially spaced gate valves each having a pair of face surfaces, which gate valves in an open position are located on opposite sides of the duct, stationary sealing plate means extending across the interior of the duct, each gate valve in its closed position having one of its face surfaces closely matched and seated on the sealing plate means, the sealing plate means completely closing the axial space between the gate valves, so that the duct is closed off completely when both gate valves are in their closed position.

4,182,360

PRESSURE REGULATING AND FLOW CONTROL VALVE

James A. Neff, Bloomfield Township, Oakland County, Mich., assignor to MAC Valves, Inc., Wixom, Mich.

Filed Apr. 11, 1977, Ser. No. 786,273
Int. Cl.[2] F16K *17/18*
U.S. Cl. 137—270 16 Claims



1. In a combination pressure regulating and flow control air valve for controlling the fluid flow through a fluid flow circuit which includes a fluid controlled apparatus, the combination comprising:

(a) a valve body and cover means having an upstream pressurized fluid supply port for connection to a source of pressurized fluid, and a downstream working port for connection to the fluid controlled apparatus in said fluid flow circuit, and a fluid flow passage interconnecting said ports;

(b) an adjustable pressure regulator valve means operatively mounted in said fluid flow passage to provide a regulated downstream pressure at the downstream working port when fluid is flowing from the source of pressurized fluid into the upstream port and to the downstrea port;

(c) an adjustable fluid flow control valve means operatively mounted in said fluid flow passage downstream from said adjustable pressure regulator valve means to provide a metering action to the flow of fluid flowing through said fluid flow passage in one direction;

(d) a check valve means operatively mounted in said fluid flow passage in parallel with said adjustable fluid flow control valve means and in series with said adjustable

pressure regulator valve means to provide a free flow action to the fluid flowing through said fluid flow passage in a direction opposite to said one direction; and,

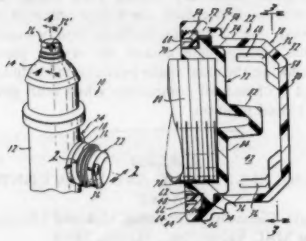
(e) said adjustable pressure regulator valve means comprising a balanced spring biased poppet valve having an adjustble first spring on the upstream side to bias the poppet valve in the opening direction to an open position, and a second spring on the downstream side to lightly bias the poppet valve in the closing direction.

4,182,361

FIRE HYDRANT PROTECTION DEVICE

Edwin J. Oakey, Fraser, Mich., assignor to Hydra-Guard Corporation, Fraser, Mich.

Filed Oct. 17, 1977, Ser. No. 842,452
Int. Cl.[2] E03B *9/02*; F16K *35/06*
U.S. Cl. 137—296 **13 Claims**



1. A protection device for fire hydrants comprising:

a cover member having at least one opening provided therein;

securing means engageable with one end of said cover member and cooperating therewith to define a radially outwardly extending annular recess adjacent said one end; and

attaching means threadedly engaging a portion of said fire hydrant for attaching said cover member and said securing means to a fire hydrant, said attaching means including an annular flange portion receivable within said annular recess cooperating with said securing means and said cover member to allow rotational movement of said cover member and securing means with respect to said attaching means, said opening in said cover member being so disposed as to provide access to an area enclosed by said cover member and said attaching means.

4,182,362

DIFFERENTIAL TRANSMITTER AND MANIFOLD MOUNTING

John E. Hewson, and Marion L. Schomer, both of Houston, Tex., assignors to Anderson, Greenwood & Co., Houston, Tex.

Filed Mar. 9, 1978, Ser. No. 884,735
Int. Cl.[2] F16K *49/00*
U.S. Cl. 137—340 **10 Claims**

1. A support structure for mounting a differential pressure transmitter, a valve manifold and the related process piping from a support stand comprising,

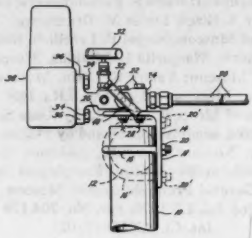
a mounting plate,

fastening means for securing said mounting plate to a support stand, and

fastening means for securing the valve manifold to said mounting plate,

a first side of said valve manifold being connected to process piping and a second side of said valve manifold being connected to the transmitter,

said transmitter and said process piping being independently removable and connectable from and to said valve manifold without disturbing the mounting of said valve manifold on said support stand.

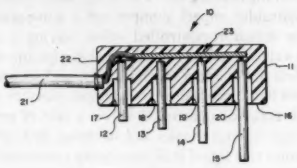


4,182,363

LIQUID LEVEL CONTROLLER

Mark W. Fuller, 547 Crother Memorial Hall, Palo Alto, Calif. 94305

Continuation of Ser. No. 745,615, Nov. 29, 1976, abandoned.
This application Nov. 24, 1978, Ser. No. 963,394
Int. Cl.[2] G05D *9/12*
U.S. Cl. 137—392 **5 Claims**



1. A liquid level control device comprising

a plurality of probes, including a high probe, a low probe and a ground probe;

solid state circuit means connected to said probes;

housing means encapsulating said solid state circuit means, including parts of each of said probes, whereby each of said probes extend from said housing through a surrounding well formed in the housing;

a cable extending from said housing, said cable including lead wires to connect the circuit to a power source, ground, and a means for controlling liquid level in a reservoir;

the probes extend through the wells and from the housing to different distances from the housing, so that when the housing is arranged in a reservoir with the probes extending downwardly therefrom, the wells extend upwardly in the housing and the probes extend different distances therefrom into the reservoir, with the high probe extending the shortest distance therefrom, the low probe extending the next greatest distance therefrom and the ground probe extending the greatest distance from the housing; and

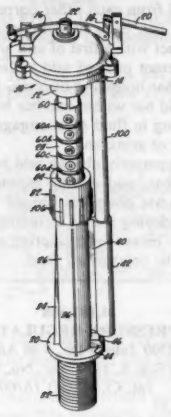
the probes extend from a face of the housing parallel to one another and in sequential order according to length, so that when the housing is positioned with the probes extending parallel to liquid in the reservoir the high probe is above the low probe.

4,182,364

ADJUSTABLE BALL COCK RISER

Russell T. Gilbert, Newport Beach, and Armand E. Antunez, Jr., Glendora, both of Calif., assignors to Coast Foundry & Mfg. Co., Pomona, Calif.

Filed Jun. 30, 1977, Ser. No. 811,609
Int. Cl.[2] F16K *31/24*
U.S. Cl. 137—426 **14 Claims**



1. An adjustable ball cock assembly for a toilet tank comprising,

a valve,

a fill pipe connected to said valve, and

an adjustable length water supply riser connected to said valve, said riser comprising

inner and outer mutually telescoped members slidably sealed to each other, one of said members being connected to said valve, and the other to said members being adapted to be connected to a tank, said inner member having a plurality of axially spaced circumferential grooves, said outer member having a plurality of axially extending resilient fingers, at least some of said fingers having inwardly directed projections, and

means for locking said projections in a selected one of said grooves, at least one of said projections extending radially of its finger by a distance greater than the depth of at least one of said grooves to insure contact of the end of the projection with the bottom of the associated groove, said one projection being adapted to be pressed into said one groove to provide increased area of interengagement and increased resistance to relative rotation with said riser members.

4,182,365

CONTROL VALVE FOR USE WITH VARIABLE DISPLACEMENT PISTON PUMP

Frank Woodruff, New Hartford, N.Y., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Sep. 26, 1977, Ser. No. 836,264
Int. Cl.[2] F16K *31/363*
U.S. Cl. 137—494 **4 Claims**

1. A valve responsive to an input pressure from a pressure utilizing means for applying an output pressure to the pressure utilizing means, comprising:

a valve housing having a sleeve longitudinally disposed therein and extending into a substantially hollow housing portion;

resilient means disposed within the hollow housing portion;

spool means displaceably disposed within the sleeve and having one end adjacent one end of the resilient means;

piston means supported to extend longitudinally into the hollow housing portion and having one end adjacent an opposite end of the resilient means;

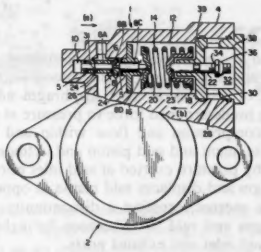
a first input pressure channel longitudinally disposed within the housing, with a first input pressure from the utilizing means being received therethrough for acting on an opposite end of the spool means;

an output pressure channel extending radially through the sleeve and the housing for transmitting an output pressure from the valve to the utilizing means;

a second input pressure channel extending radially through the housing, with a second input pressure from the utilizing means being received therethrough for acting on an opposite end of the piston means;

the spool means covering the output pressure channel and the resilient means being fully extended when the first input pressure is substantially zero;

the spool means being displaced in one sense against the force of the fully extended resilient means acting on the one end of the spool means upon an increase in the first input pressure acting on the opposite end of the spool means for uncovering the output pressure channel whereby a valve output pressure is provided thereat;



the valve output pressure being circulated through the output pressure channel to the pressure utilizing means for providing the second input pressure which is applied through the second input pressure channel and acts on the opposite end of the piston means for displacing the piston means in an opposite sense, with the one end of the piston means compresing the resilient means in opposition to the displacement of the spool means;

means for limiting the displacement of the piston means including a longitudinally extending chamber in communication with the second pressure input channel for receiving the pressure applied therethrough;

the opposite end of the piston means extending into the chamber and carrying a displacement limiting member; and

the piston means being displaced by the second input pressure within the chamber from one end thereof to the opposite end, with the piston displacement being limited when the displacement limiting member is adjacent the opposite end of the chamber.

4,182,366

POSITIVE END EXPIRATORY PRESSURE DEVICE

John R. Boehringer, 427 Parkview Dr., Wynnewood, Pa. 19096

Filed Jan. 8, 1976, Ser. No. 647,340
Int. Cl. F16K *31/12*
U.S. Cl. 137—510 **7 Claims**

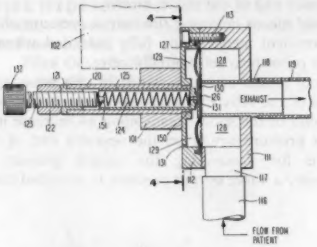
1. Positive end pressure valve apparatus comprising:

(a) a flexible diaphragm;

(b) housing means forming a chamber therein, said chamber being divided into segments by said diaphragm, said housing having an inlet port and an exhaust port penetrating a first one of said segments, said exhaust port being defined

by a hollow protuberance into said first segment opening against said diaphragm in an undeflected condition; and

(c) piston and cylinder means communicating with said housing means into the second of said segments, said cylinder being closed at one end and opening directly into said second segment at its other end, said piston travelling within said cylinder between said diaphragm and said one end, and having an elongated, hollow, cylindrical configuration, open facing said one end and closed but for a port at the end opposite said one end, said port connecting said second segment with the interior of said piston, said piston



and said cylinder having predetermined clearance for further communication of said second segment with the interior of said piston, said diaphragm and said piston offering predetermined force to pressure at said inlet port by air compression and flow within and between said second segment and said piston and cylinder means;

(d) whereby pressure exerted at said inlet port deflects said diaphragm and displaces said piston in opposition to said pressure exerted, creating a discontinuity between said diaphragm and said protuberance for exhaust flow between said inlet and exhaust ports.

4,182,367

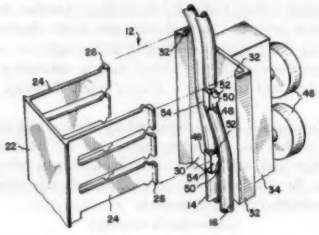
PNEUMATIC TERMINAL AND GAUGE ASSEMBLY

James L. Day, Fairport, N.Y., assignor to James L. Day Co. Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 845,697, Oct. 26, 1977, abandoned. This application Apr. 21, 1978, Ser. No. 898,752

Int. Cl.[2] G01L *19/14*

U.S. Cl. 137—557 **10 Claims**



1. A terminal assembly for a plurality of pressurized fluid lines which is adapted to be attached to a panel, said terminal assembly comprising

(a) a duct having a base arranged for attachment to said panel, flexible side flanges extending from said base in a direction away from said panel, and a cover plate having flanges which are receivable in interlocking relationship with said side flanges to define a passage running longitudinally of said duct through which said lines extend,

(b) an elongated bar of material which is impervious to said fluid disposed on said cover plate outside of said duct, said bar extending longitudinally along said cover plate, said bar having a front face and rear face, said rear face being in juxtaposition with the outside of said cover plate,

(c) a plurality of separate holes in said bar spaced from each other longitudinally along said bar, said holes extending through said bar from said front face to said rear face, a plurality of couplings each for different ones of said lines, said couplings having a plurality of arms, holes in said cover spaced from each other correspondingly with said holes in said bar, each of said couplings being disposed inside said duct with a first of said arms thereof extending through different ones of said cover holes into different ones of said bar holes and disposed in fluid tight engagement with said bar within said bar holes, different ones of said lines being in fluid tight engagement with others of said plurality of arms, and

(d) means for separately closing said bar holes at said front face of said bar, said closing means and said couplings defining separate chambers spaced longitudinally along said bar said closing means including, for at least some of said bar holes, means for measuring and displaying a characteristic of the pressurized fluid.

4,182,368

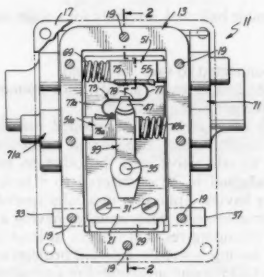
PRESSURE REGULATOR

E. Dale Hartley, 2700 Jalmia Dr., Los Angeles, Calif. 90046

Filed Sep. 8, 1977, Ser. No. 831,514

Int. Cl.[2] G05D *16/00*

U.S. Cl. 137—596.17 **17 Claims**



1. A pressure regulator comprising:

means defining first and second surface portions;

first means defining a first passage having a first port adapted to communicate with fluid at a first pressure and a second port terminating at said first surface portion;

means defining a second passage having a first port adapted to communicate with fluid at a second pressure and a second port terminating in said second surface portion;

an actuator;

means for mounting the actuator for pivotal movement about a pivot axis, said actuator including a first arm extending radially outwardly from said pivot axis on one side of said pivot axis;

said second ports being on said one side of said pivot axis and opening in generally opposite directions;

valve strip means coupled to said first arm of said actuator on said one side of said pivot axis for opening and closing said second ports, said valve strip means being constructed of thin, resilient metal;

said valve strip means including a first valve strip segment acting between the actuator and said first surface portion and a second valve strip segment acting between the actuator and said second surface portion, said valve strip segments being movable by movement of the actuator to cover and uncover said second ports;

means defining a regulated pressure chamber communicable

with said second ports whereby the amount that said second ports are open controls the pressure in said regulated pressure chamber; and

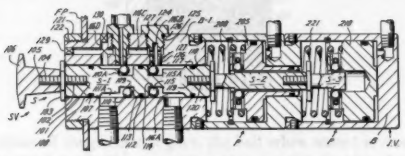
regulator means for limiting the pressure drop across at least one of said second ports to a first magnitude.

4,182,369

SPOOL VALVE AND PILOT INTERFACE ASSEMBLY

Neil H. Akkerman, New Orleans, La., assignor to Baker CAC, Inc., Belle Chasse, La.

Filed Oct. 13, 1977, Ser. No. 841,951
Int. Cl.[2] F15B *13/042*; F16K *31/122*
U.S. Cl. 137—596.18 **7 Claims**



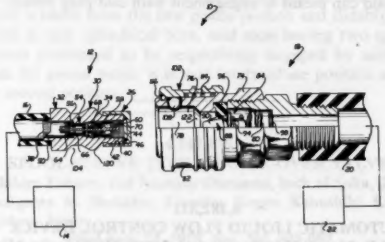
7. A bi-positionable valve assembly for controling one of pneumatic and hydraulic fluid source and respondable to another of at least one of hydraulic and pneumatic fluid source, comprising: a housing; valve means within said housing having valve seat means thereon; free travelable spherical means immediate said valve means defining valve head means and sealingly engageable onto said valve set means and wipable thereoff to selectively open and close said valve means to control fluid flow therethrough; spool means shuttleable in one of linear and rotational directions within said housing immediate said valve means and not constrained against the other of linear and rotational directions, said spool means being operably associated with said valve seat means and said valve head means to permit the selective movement of said valve head means to said seat means and selective engagement of said head and seat means upon only one of linear and rotational shuttling of said spool means, the selective engagement of said head and seat means being sealingly insensitive to the other of linear and rotational shifting of said spool means; seal means securable between said housing and said spool means to prevent fluid communication therebetween and defining flow passageways within said housing and across said spool means, said spool means being shiftable to each of first and second positions whereby pressure is substantially equalized through said flow passageways and within said valve assembly and said spool means is statically stabilized in each said position within said housing; means in association with said spool means for at least one of only mechanical and manual shuttling of said spool means to each of said first and second positions, said spool means being shuttleable to the other of first and second positions in response to activation by another of pneumatic and hydraulic fluid source; means extendible to said spool; piston head means within said housing carried around said means extendible to said spool and shiftable with respect to said spool extension means in response to variation in fluid pressure across said piston head; spherical means securable on one of said piston head and said spool extension means; means for urging said spherical means toward the other of said spool extension means and said piston head means; first and second camways defined along one of said piston head means and said spool extension for travel of said spherical means; and a shoulder on at least one of said piston head means and said spool extension means for definition between said first and second camways and for resistance of said travel of said spherical means along one of said camways when said piston head means is shifted relative to said spool extension means in one direction, said piston head means being shiftable relative to said spool extension means in a first direction in response to one of increase and decrease of fluid pressure for travel relative to said spool extension means to transfer said spherical means from one of said camways to the other of said camways without relative movement between said spool and said housing, said piston head means being shiftable relative to said spool extension means in a second direction in response to the other of increase and decrease of fluid pressure for travel relative to said spool extension means to interface said spherical means with said shoulder and carry one of said spool extension means and said piston head means to shift said one of said spool extension means and said piston head means to another position.

4,182,370

AIR CONDITIONING CHARGING APPARATUS COUPLING

Thomas D. Karcher, Rocky River, Ohio, assignor to The Hansen Manufacturing Company, Cleveland, Ohio

Filed Jun. 13, 1977, Ser. No. 805,978
Int. Cl.[2] F16L *37/22*
U.S. Cl. 137—614.04 **4 Claims**



1. An apparatus for use in charging and sealing an air conditioning system, said apparatus comprising plug means for conducting fluid to an air conditioning system during charging of the system and for at least partially blocking a flow of fluid from the air conditioning system after charging of the system, said plug means including a plug body having a base end portion adapted to be fixedly connected with the air conditioning system and an outer end portion, said outer end portion of said plug body including a plurality of external thread convolutions and an annular radially outwardly facing groove disposed between said external thread convolutions and said base end portion of said plug body, said annular groove having an area in a radial plane which is greater than the area between adjacent thread convolutions in the same plane, said plug body including internal surface means for defining a passage extending through said plug body, said passage in said plug body being disposed in a coaxial relationship with and circumscribed by said external thread convolutions and said annular groove, plug valve means disposed in said passage and operable between an open condition enabling fluid to flow through said passage and a closed condition at least partially blocking fluid flow through said passage, socket means for connecting a source of fluid under pressure with said plug means during charging of the air conditioning system, said socket means being movable between a connected condition engaging said plug means and a disconnected condition in which said socket means is spaced apart from said plug means, said socket means including a socket body having internal surface means defining a socket chamber having an outer portion for telescopically receiving said plug means when said socket means is in the connected condition and an inner portion connected in fluid communication with the source of fluid under pressure, said socket means further including means for actuating said plug valve means from the closed condition to the open condition upon movement of said socket means to the connected condition and locking means for holding said plug and socket means against axial movement relative to each other when said socket means is in the connected condition, said locking means including a plurality of locking elements disposed on said socket

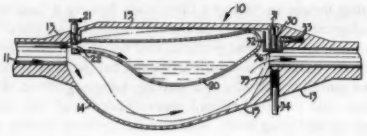
body and movable between the extended condition and a retracted condition, said locking elements extending into said socket chamber and into engagement with said annular groove on said plug body to hold said plug and socket bodies against axial movement relative to each other when said locking elements are in the extended condition and said socket means is in the connected condition, said locking elements being spaced apart from said annular groove in said plug body to enable relative movement to occur between said plug and socket bodies when said socket means is in the disconnected condition, said socket means including seal means disposed in said socket chamber for sealingly engaging a plurality of said external thread convolutions on said plug body, said seal means having a central opening in which said outer end portion of said plug body is telescopically received, and cap means for sealingly engaging said plug means when said socket means is in the disconnected condition, said cap means including internal thread convolutions which engage the external thread convolutions on the outer end portion of said plug means to hold said cap means in engagement with said plug means.

4,182,371

AUTOMATIC LIQUID FLOW CONTROL DEVICE

Donald D. Moore, 5716 Benton Ave. South, Minneapolis, Minn. 55436

Filed Nov. 14, 1977, Ser. No. 851,275
Int. Cl.[2] A01G *25/00;* **F16K** *31/365*
U.S. Cl. 137—624.11 **8 Claims**



1. An automatic water flow control valve suitable for installation in a water supply line comprising:

(a) housing means including inlet means and outlet means which are located relative to one another such that water entering through said inlet means will flow generally unidirectionally through the housing means at least as far as the outlet means;

(b) valve gate means positioned within said housing means and adapted for opening and closing said housing means to the flow of water therethrough; and

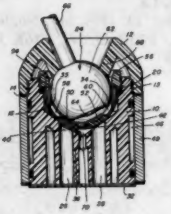
(c) expandable reservoir means located within said housing means, said reservoir means comprising a flexible bag having an open mouth and a substantially closed body, wherein said open mouth is fixed in said housing means as a sole source of support for said bag whose body is otherwise unsupported in the housing means, said open mouth being adjacent to and facing said inlet means with said bag extending from said mouth generally in the direction of the unidirectional water flow through the housing means such that the housing means is relatively compact, and wherein said open mouth is sized for receiving a portion of any water flowing through said inlet means to gradually expand said bag, said body of said bag serving to actuate said valve gate means when said bag expands to a particular extent.

4,182,372

MIXING VALVE

Hartley F. Grandin, Jr., Northboro, and Donald R. Nelson, Worcester, both of Mass., assignors to Goddard Industries, Inc., Worcester, Mass.

Continuation of Ser. No. 741,192, Nov. 12, 1976, abandoned.
This application Jun. 9, 1978, Ser. No. 913,951
Int. Cl.[2] F16K *7/12, 11/00*
U.S. Cl. 137—625.4 **17 Claims**



1. A mixing valve comprising;

a body having two inlet passages, an outlet duct and a valve cavity including a valve seat disposed therein with the inlet passages terminating in two spaced inlet ports in the seat,

a flexible diaphragm fitted in said seat,

said diaphragm having a pair of protruding nipples overlying said inlet ports,

a liner fitted in said diaphragm,

said liner having a pair of apertures therethrough overlying said nipples with each said nipple extending through said aperture,

a closure member fitted within said liner so as to normally hold the nipples of said diaphragm against said seat to cover and seal said inlet ports and prevent fluid flow through said valve,

said closure member having a diaphragm back-up surface so that upon movement of said closure member to an open position thereof fluid from at least one of said inlet ports flexes at least one of the nipples of said diaphragm away from said seat and toward said diaphragm back-up surface to open such inlet port,

and means for moving said closure member between open and closed positions and for moving said closure member to control the mixture of the fluids from the two inlet ports,

said diaphragm having a peripheral edge having top and bottom surfaces adapted to be sandwiched between said liner and body,

said liner having edge means contacting a surface of the body for limiting compression of the diaphragm to prevent excessive compression of the diagram by the liner by limiting the spacing between said liner and said contacted surface of the body thus limiting the compressed dimension between said top and bottom surfaces of the peripheral edge of said diaphragm.

4,182,373

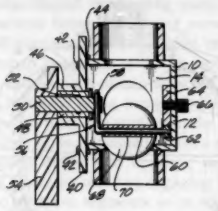
ROTARY BALL VALVE

Kenneth Lewis, 11201 S. Garfield, South Gate, Calif. 90280

Filed Feb. 16, 1978, Ser. No. 878,409
Int. Cl.[2] F16K *11/00, 25/00*
U.S. Cl. 137—625.44 **8 Claims**

1. A rotary valve comprising a housing having an enclosed chamber, a plurality of circular ports opening into said chamber, the ports being spaced circumferentially around the interior of the chamber with the centers of the circular ports lying in a common plane, a rotary member extending into the chamber with the axis of rotation extending perpendicular to said plane and equally spaced from the centers of each of said

circular ports, the rotary member including an axle portion within the chamber extending parallel to but offset from the axis of rotation of the member, a ball made of a resilient compressible material journaled on the axle portion, the ball having a diameter substantially smaller than any of the interior dimensions of the chamber but slightly larger in diameter than the circular ports, rotation of the rotating member moving the ball selectively into seating engagement with any one of said ports



to close off the particular port, the ball when seated in one of the ports being held in compression against the circular edge of the port by the rotary member to seal the port against fluid flow out of the port into the chamber, the plane defined by the axis of rotation of the rotary member and the offset parallel axle being aligned with and passing through the center of a port when the ball is seated in the port, whereby fluid pressure on the ball does not produce a turning moment on the rotary member.

4,182,374

CONTROL DEVICE FOR REGULATING THE FLOW BETWEEN A SPOUT AND A SHOWER AND CAPABLE OF CONTROLLING THE RATE OF FLOW FROM EACH INDEPENDENTLY OF THE HOT AND COLD FAUCET HANDLES

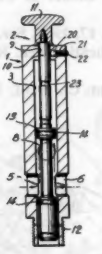
Moschoula Spanides, 82a Themistokleous St., Piraeus, Greece

Filed Sep. 21, 1977, Ser. No. 835,293

Claims priority, application Greece, Sep. 25, 1976, 51782

Int. Cl.[2] F16K *11/07*

U.S. Cl. 137—625.48 **1 Claim**



1. Apparatus adapted for being connected to hot and cold water supplies having a faucet control selectively diverting the flow of water between two outlets and for regulating the rate of flow from the selected outlet independently of the hot and cold faucet control, said apparatus comprising a hollow sleeve member having hot and cold water inlets adapted for connection to the hot and cold water supplies, and first and second outlets, and piston means slidably mounted in said sleeve for movement between a first position in which one of said outlets is blocked and the two inlets communicate with the other outlet and a second position in which said other outlet is blocked and the two inlets communicate with said one outlet, said piston means having an intermediate position between the first and second positions in which said inlets are blocked, said piston means in its movement from the intermediate position to either of the other positions gradually opening the inlets to increase the rate of flow through said inlets to the respective outlet, said first and second outlet are located on opposite sides of said inlets, said inlets being axially aligned and having oblong holes, detent means for holding the piston means in selected ones of said positions and comprising a spring-loaded ball, said sleeve member having a cylindrical bore, said piston means comprising a first piston portion confined for sealed slidable movement in said cylindrical bore, said first outlet being coaxial and coextensive with said bore, said second outlet extending laterally in communication with said bore, said first piston portion in said first position blocking said first outlet and in said second position blocking said second outlet, said pistons means comprising a stem on which said piston portion is secured, said stem being of smaller diameter than said first piston portion, said stem being slidably supported by said sleeve, and a handle on said stem for displacement of said stem and the piston portion thereon, said piston means comprising further a second piston portion secured to said stem in spaced relation from the first piston portion and slidably supported in said cylindrical bore, said stem having two spaced grooves positioned to be respectively engaged by said ball when the piston means is in said intermediate position and in said second position.

4,182,375

SPOOL-SLEEVE TYPE CHANGE-OVER VALVE

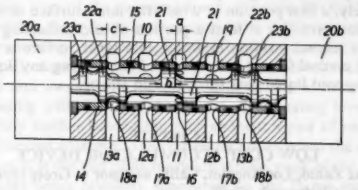
Yoshihiro Fukano, and Naotake Oneyama, both of Soka, Japan, assignors to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1978, Ser. No. 945,057

Claims priority, application Japan, May 13, 1978, 53-64153[U]

Int. Cl.[2] F15B *13/044*

U.S. Cl. 137—625.69 **1 Claim**



1. A spool-sleeve type change-over valve comprising:

a cylindrical casing provided with a fluid intake port, a pair of output ports located one on each side of said intake port, and a pair of discharge ports located respectively on the outer sides of said output ports;

a sleeve fixedly fitted in said casing and internally defining a cylindrical valve chamber, said sleeve being provided with rows of circumferentially aligned apertures including intake apertures, output apertures and discharge apertures respectively in open communication with said intake, output and discharge ports in said casing;

a spool slidably received in said sleeve and having a center land slidable across said intake apertures to connect said intake port with either one of said output ports and a pair of discharge control lands slidable across said discharge apertures to communicate the disconnected output port with the corresponding discharge port; and

operators provided at the opposite ends of said casing to shift said spool between two change-over positions thereof;

each of said intake apertures having an axial width less than the axial width of said discharge apertures, the axial width of said intake apertures being within the range of widths

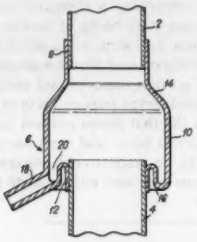
which will permit cylinders connected to said output ports to attain the same response velocity that is attained when the intake and discharge apertures all have equal axial widths.

4,182,376

DEVICE FOR DISPENSING A LIQUID FLOWING THROUGH A SUBSTANTIALLY VERTICAL TUBE

Bernt Nilsson, Forsheda, Sweden, assignor to Forsheda Gummifabrik AB, Forsheda, Sweden

Filed Aug. 8, 1977, Ser. No. 822,873
Int. Cl.² F16K *13/00*
U.S. Cl. 137—874 **3 Claims**



1. A dispensing device for dispensing a liquid flowing through a substantially vertical pipe, particularly for dispensing rain water flowing through a drainpipe, wherein the device comprises: a sleeve attached to two end portions of a pipe, said end portions defining a gap in said pipe and said sleeve bridging said gap, said sleeve having at its inner surface a circumferential collecting pocket to which is connected at least one discharge pipe for discharging liquid collected in said pocket, said sleeve comprising a circumferential resiliently deformable wall portion being adjustable into two different positions, namely, a first position in which the inner surface of said wall portion provides at least a portion of said collecting pocket, and a second position in which said inner surface is substantially conical for not collecting and discharging any liquid, and letting said liquid pass through said sleeve.

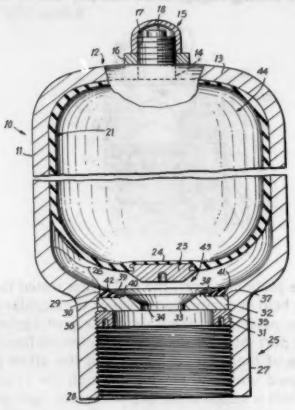
4,182,377

LOW COST ACCUMULATOR DEVICE

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Chatsworth, Calif.

Filed Dec. 4, 1978, Ser. No. 966,019
Int. Cl.² F16L *55/04*
U.S. Cl. 138—30 **4 Claims**

1. An accumulator device comprising a pressure vessel, said vessel being formed from an initially tubular blank to provide a body portion having a first end defining a gas charging port, the opposite end of said tubular blank being formed by spinning to define a generally cylindrical neck portion at its lowermost extremity merging with the interior wall of said body portion at an inwardly tapered transition portion thereof, said transition portion being generally frusto-conical, the interior of said neck portion being threaded and being formed at the end nearest said frusto-conical portion with an annular shoulder faced away from said transition portion, an annular metallic washer member mounted in said neck and having an upper surface seated against said shoulder, an annular clamp nut threaded into said neck and bearing against the lower surface of said washer clampingly to support said washer between said shoulder and said nut, said washer including an upwardly facing tapered valve seat defining an oil port, a compliant elastomeric annular buffer member mounted on the upper surface of said washer surrounding said valve seat, said buffer member including an inner peripheral portion merging with the upper surface of said washer and an outer peripheral portion intimately engaging the inwardly directed wall of said pressure vessel in the area between said shoulder and said transition portion, said buffer member at its outer peripheral portion including an annular, upwardly directed deflector lip extending into the body of said vessel to a height above the lower terminal end of said transition portion, and a bladder member formed of resilient elastomeric material, said bladder member dividing said vessel into two chambers connected,



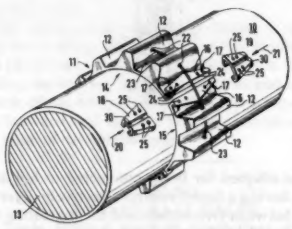
respectively, with said gas charging port and said oil port, said bladder member including a valve portion aligned with said valve seat, said lip portion of said buffer member being deflected outwardly to cover the junction of said outer periphery of said buffer member and said vessel responsive to expansion of said bladder, thereby to prevent extrusion of said bladder into said junction.

4,182,378

SPACING ELEMENT FOR SPACING AN INNER PIPE FROM AN OUTER PIPE

Kurt Dieter, Nehren, Fed. Rep. of Germany, assignor to Dieter Spezial-Isolierungen GmbH & Co., Nehren, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,922
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1976, 2647235
Int. Cl.² F16L *9/18*
U.S. Cl. 138—112 **24 Claims**



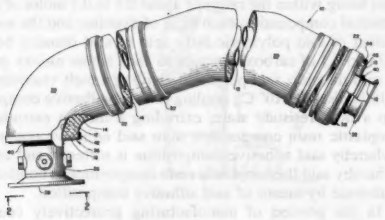
1. A spacing element for spacing a pipe from a pipe outwardly surrounding the latter, comprising an annular body including a plurality of segments adapted to be placed on an outer surface of the first-mentioned pipe and each having a plurality of projections provided with slide surfaces and adapted to abut against an inner surface of the second-mentioned pipe which outwardly surrounds said first-mentioned pipe, each of said segments having two end sections spaced from one another in a circumferential direction and each pro-

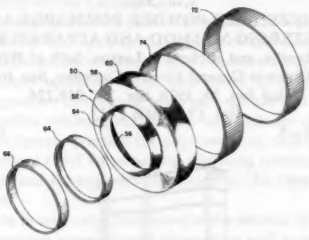
vided with a flange portion having at least one wedge surface, said segments having a longitudinal axis, and said flange portions of each of said segments being trough-shaped and having two ends spaced from one another in said longitudinal direction and a free edge extending at least from one of said ends at a predetermined angle relative to the longitudinal direction so as to define said wedge surface; and means for connecting said segments with one another including a plurality of electrically insulating wedge-shaped connecting portions, each of said connecting portions being a clamping member which is discrete from said segments and has at least one opposite wedge surface adapted to cooperate with the wedge surface of the flanges of the end sections of two adjacent segments, each of said clamping members being trough-shaped and having two further ends spaced from one another in the longitudinal direction and a further surface inclined relative to the longitudinal direction so as to define said opposite wedge surface, said trough-shaped clamping member engaging the trough-shaped flanges of two adjacent segments so as to connect said two segments with one another.

4,182,379
LOW CONDUCTING METAL SCREEN SUPPORT FLANGE

Robert G. Lestak, Agoura, and Allison L. Christensen, Lake View Terrace, both of Calif., assignors to SSP Products, Inc., Burbank, Calif.

Filed Jun. 5, 1978, Ser. No. 912,432
Int. Cl.[2] F16L *9/14*
U.S. Cl. 138—149 **18 Claims**





1. For use as a conductor of minimum amounts of heat or cold at ends of insulation on an annular duct carrying very high or very low temperature fluid, a mesh metal screen support flange comprising:

a small diameter generally cylindrical portion of said mesh screen support flange adapted to surround and be secured to a part of the duct adjacent an end of the insulation, said small diameter portion having an end adapted to be adjacent the insulation,

a radial plane portion of said screen extending from and being generally perpendicular to the axis of said small diameter portion and adapted to extend adjacent said end of the insulation, and

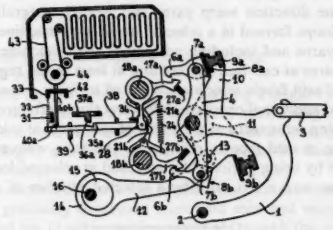
a large diameter generally cylindrical portion of said screen extending from the periphery of the radial portion,

said large diameter portion extending so as to be adapted to surround said insulation adjacent its end on said duct and being adapted to be secured around said insulation.

4,182,380
DOBBIES FOR WEAVING LOOMS

Joseph Palau, Duingt, France, assignor to Societe Anonyme des Etablissments Staubli, Faverges, France

Filed May 16, 1978, Ser. No. 906,504
Claims priority, application France, May 27, 1977, 77 17299
Int. Cl.[2] D03C *1/08*
U.S. Cl. 139—68 **9 Claims**



1. In a loom dobby having a frame supporting multiple elements which are each coupled to a heddle-driving connecting rod through a reciprocating actuating lever having a forward and a rearward stroke and which supports a double swinging lever at a central pivot located between oppositely extending arms of the swinging lever, the arms having fastening hooks at their outer ends spaced from said pivot, and the outer ends of the arms being located to abut crosspieces common to all of said multiple elements, the crosspieces oscillating toward and away from the outer ends of the arms in timed relationship with the reciprocation of the actuating lever, and the dobby further having for each element a pair of retaining hooks located adjacent to the fastening hooks when the actuating lever is at the end of its rearward stroke, each of the retaining hooks being pivotally supported on the frame and each having a first portion comprising a hook moveable between a retracted inoperative position and a fastening-hook engaging position and each retaining hook having a second selection portion pivotally connected to the first portion and coupled to spring means yieldably urging the first hook portion to said retracted position, and the dobby having locking bar means located adjacent to said first portions of the retaining hooks and reciprocated into and out of engagement therewith in timed relationship with the reciprocation of the actuating lever to lock the retaining hooks into their selected positions and to unlock the retaining hooks for selection on alternate reciprocations of the actuating lever, and the dobby having a pattern mechanism, and having means selected by the pattern mechanism and operative for actuating said second selecting portions of the retaining hooks, said means comprising:

a single pusher member contacting both second selecting portions in each pair of retaining hooks and operative to actuate said second portions;

at least one driving member corresponding with each pusher member and selectable by said pattern mechanism;

and actuating means driven in timed relationship with said stroke and operative to displace each driving member when selected to thereby actuate the corresponding pusher member.

4,182,381

PAPERMAKERS FABRICS

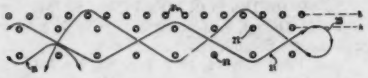
Bryan J. Gisbourne, Blackburn, England, assignor to Scapa-Porritt Limited, Blackburn, England

Filed Aug. 8, 1977, Ser. No. 822,668

Claims priority, application United Kingdom, Aug. 10, 1976, 33199/76

Int. Cl.[2] **D03D** *15/00;* **D21F** *1/10, 7/08*

U.S. Cl. 139—383 A **21 Claims**



1. A flat-woven papermakers fabric including a base weave structure comprised of cross-machine direction weft yarns and machine direction warp yarns and having integrally formed warp loops formed in a selected number of machine direction warp yarns and including additional cross-machine direction weft yarns at one face thereof and at least in the region of the ends of said fabric which are adapted to form a seam thereat, the said additional cross-machine direction weft yarns lying or extending outwardly of the plane of said seam at said face and floating at said face in relation to the base weave structure thereof by being periodically attached at selected locations to the base weave structure by a selected number of said warp yarns.

4,182,382

THERMOPLASTIC RESIN-COATED METALLIC SUBSTRATE AND THE METHOD OF PRODUCING THE SAME THROUGH USE OF A POLYAMIDE ADHESIVE LAYER

Glen E. Ingraham, Lebanon, N.J., assignor to Colorguard Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 546,701, Feb. 3, 1975, abandoned. This application Dec. 1, 1975, Ser. No. 636,565

Int. Cl.[2] **B05D** *7/20;* **B29F** *3/10;* **B32B** *15/02, 15/08*

U.S. Cl. 140—3 R **50 Claims**

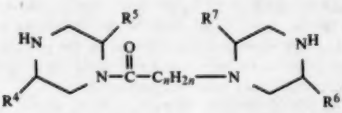
1. A metallic wire substrate whereon is disposed a protective laminate comprising as a first ply a polyamide hot melt adhesive bonded to said substrate, said polyamide comprising the condensate of

(1) an poly amide-forming dicarboxylic compound having the formula:

$$R^1OOCR^3COOR^2$$

or compounds hydrolyzable thereto, wherein each of R^1 and R^2 is hydrogen, an alkyl group or an aryl group; and R^3 is an aliphatic, cycloaliphatic or an aryl radical; or

(2) a polymeric fatty acid having a dimeric fat acid content of at least 90 percent by weight; or mixtures thereof; and a diamine of the formula:



wherein each of R^4, R^5, R^6 and R^7 is a hydrogen atom or an alkyl radical; and n is an integer of from 1 to 6 inclusive;

the ratio of said difunctional amide-forming compound to said diamine being within the range of about 0.5 to 0.7 moles of said difunctional compound to each mole of diamine; and the molar equivalent of said polymeric fatty acid to said diamine being from 0.9 to 1.1 of carboxyl groups to each amine moiety present in said diamine;

said polyamide having a melt viscosity of 10 to 100 poises at 210° C.;

and a second ply of an extrudable thermoplastic resin adhering to said substrate by means of said adhesive.

26. A continuous process for applying and bonding a protective coating to a metallic wire substrate that comprises applying to a rapidly advancing length of said substrate a first ply of a molten polyamide resin hot melt adhesive at a temperature of from 300° F. to 450° F.; said polyamide comprising the condensate of

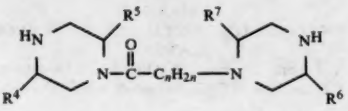
(1) a polyamide-forming dicarboxylic compound of the formula:

$$R^1OOCR^3COOR^2$$

or compounds hydrolyzable thereto, wherein each of R^1 and R^2 is hydrogen, an alkyl group or an aryl group; and R^3 is an aliphatic, cycloaliphatic or an aryl radical; or

(2) a polymeric fatty acid having a dimeric fat acid content of at least 90 percent by weight or mixtures thereof:

and a diamine of the formula:



wherein each of R^4, R^5, R^6 and R^7 is a hydrogen atom or an alkyl radical; and n is an integer of from 1 to 6 inclusive; the ratio of said difunctional amide-forming compound to said diamine being within the range of about 0.5 to 0.7 moles of said difunctional compound to each mole of diamine; and the molar equivalent of said polymeric fatty acid to said diamine being from 0.9 to 1.1 of carboxyl groups to each amine moiety present in said diamine; said polyamide having a melt viscosity of 10 to 100 poises at 210° C.; cooling the said adhesive composition to a flow resistant state; extruding a molten extrudable thermoplastic resin composition onto said adhesive composition whereby said adhesive composition is softened and cooling, whereby said thermoplastic resin composition is bonded to said substrate by means of said adhesive composition.

44. In the process of manufacturing protectively coated chain link fence fabric, the steps that comprise forming a protectively coated wire substrate as claimed in claim 26.

4,182,383

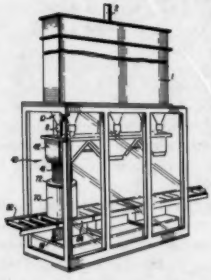
FLUIDIZED BED POWDER DISCHARGE AND METERING METHOD AND APPARATUS

John T. Adomitis, and Richard I. Larson, both of Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.

Filed Jun. 23, 1978, Ser. No. 918,224

Int. Cl.[2] **B65B** *1/32*

U.S. Cl. 141—5 **13 Claims**



1. An apparatus to discharge and meter powder from a

fluidizing vessel into a container positioned below the vessel comprising:

(a) a valve mounted below said vessel to control the discharge of powder from said vessel;

(b) a conduit assembly disposed between said valve and said container;

(c) said vessel, valve, conduit assembly and container forming a substantially pressure-tight system for minimizing pressure differential across said valve caused by fluidizing gas;

(d) means to alternately open and close said valve to cause short duration discharges of powder;

(e) means to measure the weight of powder discharged into said container; and

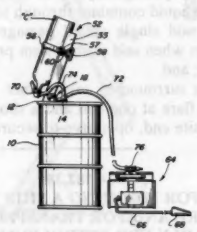
(f) means to discontinue opening of said valve when a predetermined weight of powder has been discharged into said container.

4,182,384

FIRE EXTINGUISHER DISCHARGE STATION

William J. Zehr, Des Plaines, Ill., assignor to The Protectoseal Company, Bensenville, Ill.

Filed Jul. 3, 1978, Ser. No. 921,724
Int. Cl.[2] B65B *31/00*
U.S. Cl. 141—7 **4 Claims**



1. A pressurized fire extinguisher discharge station comprising:

(a) a drum;

(b) a cover for said drum;

(c) an inlet in said cover positioned adjacent the periphery of said cover and open to the interior of said drum;

(d) a cradle anchored at one end to said cover and extending angularly upwardly from said cover to support a fire extinguisher cylinder in inverted position and means for releasably retaining said pressurized cylinder on said cradle in inverse position for depressurizing said cylinder;

(e) a hollow relief valve having a housing connected to said cover and having communication to the interior of said drum;

(f) a tube in said valve connected to the interior of said drum;

(g) a vacuum pump, means connecting said pump and said drum through said tube for creating a vacuum in said drum;

(h) a horizontally disposed, hollow, cylindrical filter disposed in the upper end of said drum and secured to and depending from said cover and having fluid connection to said valve through which the ambient air in the drum must flow in creating a vacuum in said drum; and

(i) flexible conduit means connected between said cover inlet and a depressurized cylinder having dry powder therein;

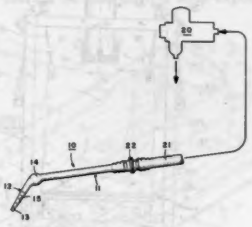
whereby when said pump is energized, a vacuum will be created in said drum and withdraw the powder from the cylinder into the interior of said drum.

4,182,385

VACUUM EVACUATION APPARATUS

Ron T. Williamson, Box 19822, Houston, Tex. 77024

Continuation-in-part of Ser. No. 655,217, Feb. 4, 1976, abandoned. This application Aug. 19, 1977, Ser. No. 826,167
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—65 **3 Claims**



1. Vacuum evacuation apparatus comprising:

a vacuum system;

a one-piece hollow tubular member having a single vacuum end section attached to said vacuum system, a single flexible operational end section provided with an end tip, and an enlarged non-compression type section between said end sections;

the inner cross-sectional areas of said operational end section being gradually decreased from said enlarged section to said end tip, to aid in passing material through the remainder of said tubular member, said enlarged section having inner cross sectional areas increasing from its point of connection with each end section to form a bubble, said bubble having a size sufficient to create a swirling motion for fluids and particles of materials evacuated through said operational end section and to act as a damper in the event a surge of vacuum occurs, the vacuum forces at the tip of said operational end section being responsive to the size of said bubble; the lateral suction force component of the vacuum force being reduced at said end tip of said operational section causing thereby an increase in axial suction force component along the axis of said operational end section and causing the resultant force vector to move closer to the axial force component to substantially eliminate the undesirable vacuum of materials from sites other than the pin point operative site of said operational end section.

4,182,386

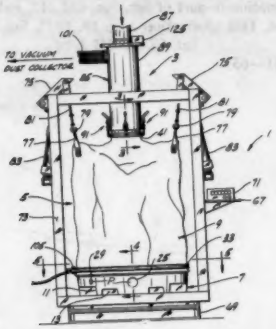
CLOSED SYSTEM AND CONTAINER FOR DUST FREE LOADING AND UNLOADING OF POWDERED MATERIALS

Charles S. Alack, St. Louis, Mo., assignor to Semi-Bulk Systems, Inc., St. Louis, Mo.

Filed Nov. 30, 1977, Ser. No. 855,935
Int. Cl.[2] B65B *1/32*
U.S. Cl. 141—83 **26 Claims**

1. A closed system for filling a container with a load of powdered or granular fluent material substantially to prevent the escape of dust during filling of the container, said container having an opening at its top, said opening being defined by a substantially rigid collar, said collar having a sleeve, the upper portion of said container being secured to said sleeve in sealed relation, said system further comprising delivery means comprising filling means for delivery of said fluent material through the opening into said container and means for removing air from within said container displaced upon filling of the container substantially without the emission of dust to the atmosphere, said delivery means further comprising a delivery head including a first conduit that communicates with the filling means and a second conduit that communicates with the air removing means, and means for releasably securing said

collar to said delivery means during filling, said delivery head engaging said collar in sealed relation, and both said first and



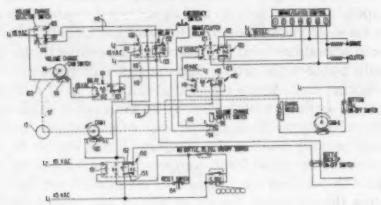
second conduits being in communication with the interior of the container through the opening therein when said collar is secured to said delivery means.

4,182,387

AUTOMATIC FILLING MACHINE

Lawrence W. Buckley, Baltimore, and Richard N. Bennett, Arbutus, both of Md., assignors to National Instrument Company, Inc., Baltimore, Md.

Filed Oct. 11, 1978, Ser. No. 950,285
Int. Cl.[2] B65B 3/04
U.S. Cl. 141—129 **27 Claims**



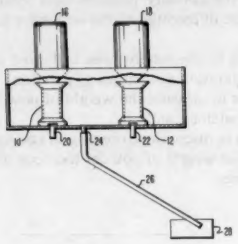
1. A filling machine for simultaneously filling several containers with predetermined amounts of a product, comprising several spaced nozzle means corresponding in number to the several containers to be filled simultaneously, a number of filling units corresponding to the number of nozzle means, each filling unit forming a pump assembly including cylinder means, piston means carried by a piston rod and adapted to reciprocate in said cylinder means to provide suction and discharge strokes, and suction and discharge means in communication with the pump space of the cylinder means, a respective discharge means being adapted to be connected with a corresponding nozzle means and a respective suction means being adapted to be connected with a supply of the product, the cylinder means being operatively connected with a relatively fixed part of the machine, and common actuating means for the piston rods of the several filling units including two driving members, a common driven member and two volume-changing means operatively connecting the driving members with the driven member to permit selective change of the amount of the product to be dispensed by the filling units, characterized by interconnecting means for interconnecting the two volume-changing means with each other to enable adjustment of the two volume-changing means in unison, and volume-change-stopping means for stopping the driving members in a predetermined position to enable installation of the interconnecting means between the two volume-changing means.

4,182,388

FLUID COUPLING SYSTEM

Kenneth R. Sellen, Dearborn Heights, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 2, 1978, Ser. No. 930,375
Int. Cl.[2] B65B 3/04
U.S. Cl. 141—351 **4 Claims**



1. A fluid coupling system for connecting a liquid container to a device liquid input port comprising:

a cap assembly having a pair of arcuate fluid inlets connected to a first fluid passageway, operative to permit the flow of the liquid from said liquid container;

a pusher stem having a second fluid passageway operative to form a single sealed passageway consisting of said first and second fluid passageways, to thereby permit liquid to flow from said liquid container through said arcuate fluid inlets through said single sealed passageway into said liquid input port when said pusher stem presses against said cap assembly; and

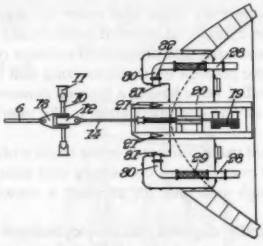
a cap guide surrounding said pusher stem, said cap guide having a flare at one end and a shoulder approximate to the opposite end, operative to secure said cap assembly.

4,182,389

SYSTEM FOR MOORING A SHIP TO A LOADING STRUCTURE AND FOR TRANSFERRING A FLUID, PARTICULARLY FOR PETROLEUM INSTALLATIONS

Daniel Guillaume, Rueil-Malmaison, and Samuel Tuson, Mesnil-le-Roi, both of France, assignors to Entreprise d'Equipements Hydrauliqes E.M.H., France

Filed Nov. 21, 1977, Ser. No. 853,539
Claims priority, application France, Nov. 25, 1976, 76 35543
Int. Cl.[2] B65B 1/04
U.S. Cl. 141—387 **9 Claims**



1. A system for mooring a ship or like floating vessel to an off-shore structure and for transferring a fluid between duct means provided on said ship and on said structure, respectively, comprising: at least one hawser connected at one of its ends to said structure and having a free end and at least one fluid transferring hose pipe connected at one end to said duct means provided on said structure and provided at its other free end with connecting means adapted for being coupled to said

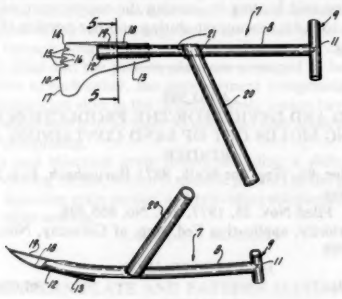
duct means on said ship, and a tow-line having one end adapted to be picked up by the ship and a free end, the free end of said hawser and the free end of said tow-line being connected to said connecting means, said connecting means being retained at said structure in a stowage position, said connecting means being a U-shaped unit, the base of which being pivotally fluidly connected to said free end of said hose pipe whereas the legs of said U-shaped unit are interconnected by a bar member and provided with flanges aligned along the direction of said bar member to open outwardly, said flanges being adapted for connection with said duct means provided on said ship through rotary joints mounted in registering relationship with the axis of said bar member, so that the said U-shaped unit is rotatable about said axis, said bar member being fitted in particular on its central portion, with at least two clevises connectable to said free ends of said hawser and tow-line, respectively.

4,182,390

ROOF SHINGLE REMOVER TOOL

Jerome A. Renner, Slinger, Wis., assignor to Harvey G. Kuhlman, Menomonee Falls, Wis.

Filed Jul. 31, 1978, Ser. No. 929,456
Int. Cl.[2] B66F *15/00*
U.S. Cl. 145—1 A **9 Claims**



1. A shingle removal tool, comprising a support shaft member, a curved plate-like blade member secured to one end of said shaft member and having an elongated outer chisel edge, said blade member curving upwardly and outwardly of the handle and past the end of the shaft member, a first portion of said edge including a plurality of edge notches and another portion coextensive with the first portion and equal in length to at least two of said notches being essentially continuous, a handle member secured to the shaft member, and a guide handle secured to an intermediate portion of the shaft member between the blade member and the handle member and extending outwardly and slightly rearwardly.

4,182,391

COMBINED GOLF BAG AND EQUIPMENT CARRIER

Kenneth L. Kjose, 1306 N. Columbus Ave., Apt. #312, Glendale, Calif. 91202

Filed May 25, 1978, Ser. No. 909,206
Int. Cl.[2] A63B *55/00*
U.S. Cl. 150—1.5 R **6 Claims**

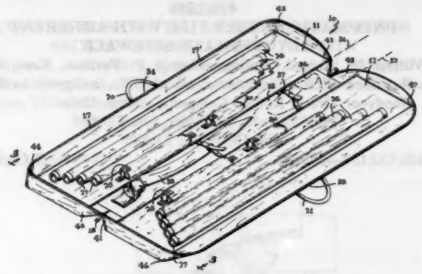
1. A combined golf bag and equipment carrier comprising:

a monolithic body or case construction having an elongated central strip with box-like sections attached to opposite sides of said central strip;

closure means along the opposing edges of said box-like sections extending from one end of said central strip to its opposite end;

said body or case construction having a first and a second position defined by reversing each of said box-like sections over upon themselves to convert said construction into a golf bag as said first position and an equipment carrier as said second position; and

carrying means carried on said central strip exposed exter-



nally for carrying said body or case construction when in its first position and handle means carried on said box-like sections adjacent a portion of said closure means for carrying said body or case construction in said second position;

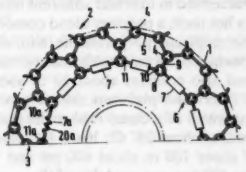
said body or case construction is composed of a flexible and pliable composition adapted to permit the corners of said box-like sections to be pushed inside out to reverse said construction between said first and said second positions.

4,182,392

PROTECTIVE TIRE CHAIN

Anton Müller, Aalen-Unterkochen, Fed. Rep. of Germany, assignor to Eisen und Drahtwerk Erlau Aktiengesellschaft, Aalen, Fed. Rep. of Germany

Continuation of Ser. No. 696,080, Jun. 14, 1976, abandoned.
This application Mar. 10, 1978, Ser. No. 885,386
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1975, 2526413
Int. Cl.[2] B60C *27/12*
U.S. Cl. 152—219 **6 Claims**



1. In combination with a network of a tire chain having side chains and a sleeve including end faces and a slot, especially in a tensioning device integratable in side chains thereof, which provides a first link member having a guide shank including a locking device and a second link member releasably connected with adjoining chain elements in peripheral direction of the side chains, the link members being opposite each other with axial spacing therebetween and at least the first link member being axially shiftable against the sleeve as well as being latchable with the locking device relative to the sleeve in an extended position of the tensioning device, the locking device providing a locking means provided along the guide shank of the first link member and having a protrusion with opposing end surfaces arranged complementary thereto, the improvement therewith which comprises a compression spring mov-

able within the sleeve in peripheral direction spaced from the protrusion, said spring having ends thereof braced against the sleeve and opposing end faces of the protrusion, the locking means including flange and collar means formed by the locking device of the guide shank, the flange and collar means comprising partially circular segmental webs having a bent outer surface connecting with an inner wall of the sleeve.

4,182,393

PNEUMATIC RUBBER TIRE WITH ADHERENT POLYURETHANE SIDEWALL

William M. Larson, Hudson; George P. Patitsas, Kent, and Raymond B. Roennau, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 13, 1978, Ser. No. 877,057
Int. Cl.[2] B60C *13/00*
U.S. Cl. 152—353 R **9 Claims**

1. A pneumatic rubber tire, having a ground contacting tread portion, spaced beads, and inner-connecting sidewall portions extending radially from said tread portion to said spaced beads and an inner, reinforcing carcass portion extending from bead to bead, at least one of said sidewalls having an adherent outer surface of a polyurethane inlay laminate thereon characterized in that said adherent inlay is provided by applying, as a hot melt, a polymer blend comprised of 100 parts by weight thermoplastic polyurethane, and, about 10 to about 150 parts by weight of an uncured halobutyl rubber, where said polymer blend also contains about 10 to about 150 parts by weight inert fillers and pigments, into a groove in the outer surface of a sidewall of a cured rubber tire and where the said polymer blend, at about 25° C., has a 100 percent modulus in the range of about 100 to about 600 psi and within about 25 percent of the 100 percent modulus of the cured rubber of the sidewall to which it is adhered at 25° C.

4,182,394

ROTARY ROCK BIT BEARING PIN HARDFACING METHOD AND APPARATUS

George A. Cason, Jr., Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 5, 1978, Ser. No. 939,631
Int. Cl.[2] B22D *19/08, 25/02*
U.S. Cl. 164—4 **5 Claims**

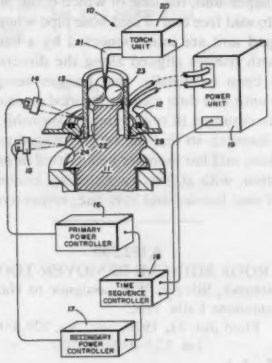
1. A method of hardfacing a rotary rock bit bearing pin, comprising the steps of:

providing a rotary rock bit bearing pin;

positioning a crucible around said rotary rock bit bearing pin to cooperate with said rotary rock bit bearing pin to define a mold cavity;

placing hardfacing material in said crucible;

heating said hardfacing material and crucible so that said hardfacing material flows into said mold cavity and around at least a portion of said rotary rock bit bearing pin;



controlling said heating by sensing the temperature of said crucible during a portion of said heating; and

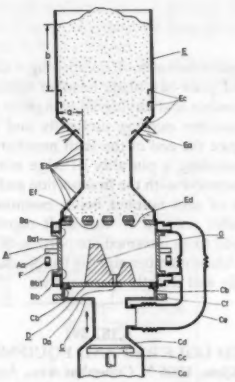
controlling said heating by sensing the temperature of said rotary rock bit bearing pin during another portion of said heating.

4,182,395

METHOD AND DEVICE FOR THE PRODUCTION OF CASTING MOLDS OUT OF SAND CONTAINING A BINDER

Eugen Bühler, 96, Weg Zur Walk, 8871 Burtenbach, Fed. Rep. of Germany

Filed Nov. 28, 1977, Ser. No. 855,395
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1976, 2653788
Int. Cl.[2] B22D *15/22*
U.S. Cl. 164—7 **36 Claims**



1. In a method of manufacturing a casting mold from a binder-container molding sand, in which injection takes place through a grate which seals a sand chamber and which grate also functions as a press plate, the molding sand being injected into a mold container under a venturi pipe effect, whereby the oppositely positioned other opening of the mold container is sealed by means of a pattern plate which is connected to a vacuum source, and whereby after the filling of the mold

container a secondary compressing of the sand takes place by means of a relative movement between the pattern plate and the injection grate, and after separation from the pattern plate two mold sections are completed into a casting mold, the improvement comprising the steps of:

(a) providing the injection grate with closable injection slots having a width of at least 50 mm;

(b) connecting the hollow space of the mold container to a vacuum source, and initially evacuating the mold container to a low pressure of at least 0.08 atmospheres;

(c) for the purpose of injecting the sand, confining the sand in the sand chamber in the venturi neck to a cross-sectional area of from about 1000 cm^2 to 2000 cm^2 so as to produce the venturi pipe effect before penetration through the injection grate; and instantaneously stressing the hollow space of the mold container with the full vacuum of at least 0.2 atmospheres vacuum, and retaining this vacuum after injecting the sand; and

(d) removing the vacuum after the secondary compressing and prior to separating the mold section from the pattern plate.

20. In an apparatus for manufacturing casting molds from a binder-containing molding sand, comprising at least one sand chamber in the shape of a venturi pipe, a mold container, an injection grate means between said mold container and venturi pipe functioning in the form of a press plate and sealing one opening of a mold container, and having a hollow pattern plate which seals the other opening of the mold container, the inside of the hollow pattern plate being connected with the inside of the mold container by evacuation nozzles, a vacuum source, an evacuation duct connecting the inside of said pattern plate and said vacuum source, and a control valve in said duct and the press plate and the pattern plate are arranged to be displaced relative to each other, the improvement comprising:

(a) injection slots in the injection grate means having a minimum width of at least 50 mm; and said apparatus further comprising,

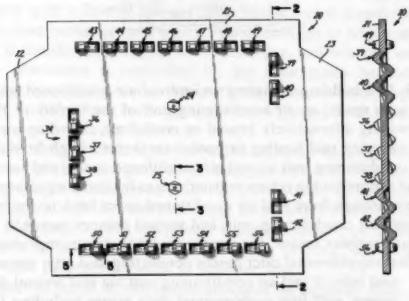
(b) said injection grate means including a slide plate as a closing means; which is slidable parallel to the plane of the injection grate means, and providing substantially vacuum tight sealing.

4,182,396

PATTERN PLATE AND PATTERN MATCH PLATE ASSEMBLY

Bruce A. Clark, 3023 Snelling Ave., Minneapolis, Minn. 55406

Filed Oct. 10, 1978, Ser. No. 949,972
Int. Cl.[2] B22C *7/04*
U.S. Cl. 164—243 **41 Claims**



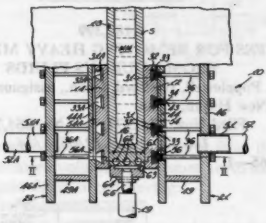
1. A pattern plate for supporting a pattern useable to make a sand mold having cope and drag mold sections comprising: a body having a first flat surface and a second flat surface located parallel to the first surface for carrying a pattern, and a plurality of lug and recess sets located in said body to provide cooperating pockets and bosses in the cope and drag mold sections, each lug having a convex surface and inwardly tapering side walls, said convex surface including generally centrally located pad means, said pad means providing a well in the pocket in the mold sections to accommodate foreign materials, each recess having a concave surface substantially corresponding in size and shape with the lug whereby a boss formed in one mold section fits into a pocket in the other mold section.

4,182,397

CONTINUOUS CASTING MOLD AND MEANS FOR SECURING MOLD LINERS THEREIN

William A. Schmucker, Cedarburg, and Lloyd M. Dings, Jr., Brookfield, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jul. 3, 1978, Ser. No. 921,471
Int. Cl.[2] B22D *11/124*
U.S. Cl. 164—443 **3 Claims**



1. In a continuous casting mold which includes a mold liner, said casting mold having a backup structure to which said mold liner is secured in abutting relationship, the improvement of a plurality of vertical cooling water passages formed in the surface of said liner which abuts said backup structure;

a plurality of holding bar members each engageable within an associated vertical cooling water passage, each said holding bar member including tapped holes extending completely therethrough, said holding bar members when in operating position serving as a vertical side for said vertical cooling water passages;

a plurality of securing bolts extending through the said backup structure into threaded holding connection with said tapped holes of said bar members, said threaded connection being effected adjacent to said water cooling passages; and,

water inlet and outlet means communicating with all of said water passages to provide a circulation of cooling water in said passages;

whereby heat is uniformly transferred and the threaded ends of the securing bolts associated with said liner are cooled without interfering with the uniform heat transfer from said liner.

4,182,398

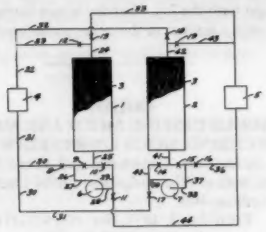
CROSSLINKED CRYSTALLINE POLYMER AND METHODS FOR COOLING AND HEATING

Ival O. Salyer; Ruth A. Botham, both of Dayton, and George L. Ball, III, West Carrollton, all of Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 4, 1977, Ser. No. 784,488
Int. Cl.[2] F28D *21/00*
U.S. Cl. 165—1 **14 Claims**

1. A method for removing heat from a fluid comprising circulating a fluid through crystalline polyethylene silane-grafted-crosslinked polymer pieces crosslinked to retain at least 70% of the heat of fusion of the uncrosslinked crystalline

polymer and sufficiently crosslinked for the pieces not to stick together upon being cycled above and below the melting point



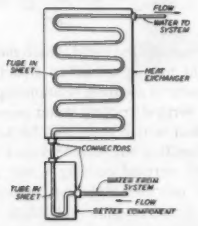
of said polymer, said fluid having a temperature above the melting point of said polymer.

4,182,399

PROCESS FOR REMOVING HEAVY METAL IONS FROM AQUEOUS FLUIDS

James M. Popplewell, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 15, 1977, Ser. No. 851,700
Int. Cl.[2] F28F *19/00, 3/14*
U.S. Cl. 165—1 **13 Claims**



1. A method for removing corrosive heavy metal ions from a fluid heat exchange medium used in a solar energy collector system including at least one heavy metal element and at least one heat exchange panel having passage surfaces of aluminum or aluminum alloy, said method comprising:

providing a panel type getter, said getter being provided with a passageway having an alloy surface layer of material which has a high affinity for heavy metal ions,

placing said getter upstream of and in close proximate contact with said heat exchanger, and,

turbulently passing said heat exchange medium through said getter passageway thereby removing heavy metal ions from said heat exchange medium prior to contact of said ions with said heat exchange panel.

4,182,400

COUNTERCURRENT HEAT TRANSFER APPARATUS AND METHOD

Noel H. de Nevers, Salt Lake City, Utah, assignor to Oros Company, Salt Lake City, Utah

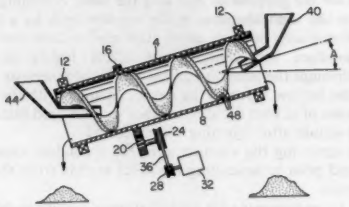
Filed Sep. 18, 1978, Ser. No. 943,057
Int. Cl.[2] F28C *3/10*
U.S. Cl. 165—1 **8 Claims**

1. A method of transferring heat from one granular material to another comprising

introducing into one end of a generally cylindrical drum a first granular material composed of particles of generally a first size and being of a certain temperature,

said drum being positioned so that its cylindrical axis is inclined with said one end of the drum being higher than the other end, a helical auger being disposed in said drum, the flights of said auger including a plurality of apertures having a size which is larger than said first size, the outer lip of said flights being curved toward said one end of the drum,

introducing into said other end of the drum a second granular material composed of particles generally of a second size and being of a temperature different from said certain



temperature, said second size being larger than the size of said apertures, and

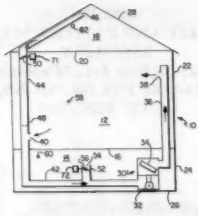
rotating said auger to move said second granular material upwardly toward said one end of the drum, and to enable sifting downwardly of said second granular material through the apertures in said flights toward said other end of the drum, the first and second granular materials thereby contacting one another to allow transfer of heat therebetween.

4,182,401

SUPPLEMENTAL HEATING AND COOLING SYSTEM

Carrell I. Pinnell, 810 N. Palafox St., and John W. Merting, 421 N. Palafox St., both of Pensacola, Fla. 32501

Filed Jul. 1, 1977, Ser. No. 812,315
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—2 **4 Claims**



1. In a building including an internal air conditioned space, an attic space, an air conditioning unit of the forced air type providing alternatively heated or cooled air, first duct means for carrying said heating or cooled air therethrough from said air conditioning unit to said air conditioned space, and second duct means having return register means for carrying return air therethrough from said air conditioned space back to the inlet of said air conditioning unit, and second damper means in the return register means, the improvement therein comprising:

first supplemental duct means connecting said attic space to said inlet of said air conditioning unit via said second duct means, said first supplemental duct means including first damper means spaced between the attic and the return register means, said first damper means when closed preventing, and when open permitting, flow of air through said first supplemental duct means from said attic space to said air conditioning unit inlet,

control means for controlling the temperature in said air conditioned space including temperature sensors in said

attic space and said air conditioned space, means to actuate said first damper means,

whereby air from said attic space can be circulated to said air conditioned space when said attic space is warmer than said air conditioned space,

and means to actuate the second damper means to close the same when the first damper means is open and to open said second damper means when the first damper means is closed.

4,182,402

ROTARY REGENERATIVE AIR HEATER

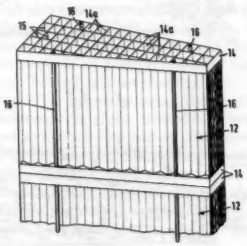
Fritz Adrian, Ratingen, Fed. Rep. of Germany, assignor to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed Nov. 14, 1977, Ser. No. 851,356

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1976, 2652594

Int. Cl.² F28D *17/00*

U.S. Cl. 165—10 **4 Claims**



1. In a regenerative gas-to-gas heat exchanger which is useable as an air heater, for example, and which has a heat exchanger stack of which at least a portion is alternatingly in contact with a flow of hot gas from which heat is transferred to the heat exchanger and with a flow of cold gas to which said heat is transferred from the heat exchanger, and wherein said flow alternation is controlled by gas flow guide members moving over intake and outlet apertures of the heat exchanger stack; in such a heat exchanger, a heat exchanger stack assembly comprising in combination:

a plurality of stack layers mounted adjacent to each other and having arranged therein a large number of small flow passages which are so oriented that a stream of gas flowing through the heat exchanger successively traverses the stack layers, each stack layer being constituted by a number of adjoining lamellae packages defining said small flow passages between its lamellae; and

a pair of guide screen layers arranged on opposite sides of each stack layer in such a way that the gas flowing from one stack layer into another has to traverse the guide screen layers, each guide screen layer being similarly constituted of separate guide screen panels for each lamellae package; and wherein

each lamellae package is held together by its associated pair of guide screen panels and by at least one tie rod extending between the two guide screen panels.

4,182,403

ARRANGEMENT FOR TRANSFERRING HEAT FROM THE EXHAUST AIR LEAVING AN ENCLOSED VOLUME TO THE INPUT AIR SUPPLIED TO SAID VOLUME

Peter H. E. Margen, Nyköping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

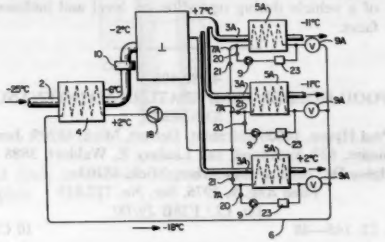
Division of Ser. No. 752,992, Dec. 21, 1976, Pat. No. 4,119,142.

This application Jul. 14, 1978, Ser. No. 924,680

Claims priority, application Sweden, Dec. 22, 1975, 7514560

Int. Cl.² F28D *15/00*

U.S. Cl. 165—12 **12 Claims**



1. An arrangement for the transfer of heat from the exhaust air leaving an enclosed volume to the input air to said volume comprising a liquid filled circuit having:

at least one first circulation pump;

at least one first heat exchanger arranged in contact with the input air flow;

at least one second heat exchanger arranged in contact with the exhaust air flow;

valve means for controlling the liquid flow through said second heat exchanger;

a plurality of by-pass lines arranged in said circuit in parallel with said second heat exchanger for supplying heat to said first heat exchanger in the form of heat extracted from said exhaust air while said second heat exchanger is disconnected from said liquid filled circuit for defrosting;

an auxiliary second heat exchanger coupled into each of said by-pass lines; and

a shut-off valve incorporated in each of said by-pass lines.

4,182,404

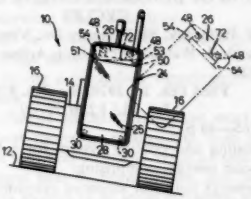
RADIATOR TOP TANK WITH PLURAL SUMP LINES

Paul J. Beveridge, and Myron L. Vigesaa, both of Springfield, Ill., assignors to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Dec. 27, 1977, Ser. No. 864,726

Int. Cl.² F01P *3/18, 7/14;* F28F *9/22*

U.S. Cl. 165—41 **9 Claims**



1. A cooling system for use with a vehicle operating on level and sloped surfaces comprising:

a radiator for circulating liquid coolant to an engine of a vehicle,

said radiator having a core section and a top tank,

coolant return means operatively coupled to the core section for directing coolant to a coolant outlet of an engine,

radiator fill means operatively coupled to the core section for receiving coolant from a coolant outlet of an engine,

said top tank having a pair of spaced outlet ports and an inlet port,

conduit means coupled between said spaced outlet ports and the coolant return means to direct coolant from at least one of the outlet ports to the coolant return means to maintain flow of coolant to the coolant inlet of an engine of a vehicle during operation on level and inclined surfaces.

4,182,405

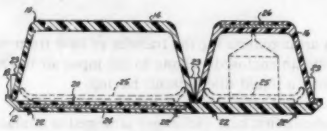
FOOD HOLDER TEMPERATURE MAINTENANCE SYSTEM

P. Paul Hysen, 14500 Fairmont, Detroit, Mich. 48205; James J. Souder, 630 Archwood, and Lindsay E. Waldorf, 3888 Lock Alpine Dr., both of Ann Arbor, Mich. 48103

Filed Aug. 9, 1976, Ser. No. 712,819

Int. Cl.[2] F25B *29/00*

U.S. Cl. 165—48 **10 Claims**



1. A food holder arrangement comprising:

a tray having an upper, substantially planar surface;

first cover means adapted to be disposed on said tray so as to overlie a first region of the upper surface of the tray to define, along with said first region, a hot food enclosure;

a heat retaining insert carried by said tray in the first region of said surface of said tray or by said first cover means, adapted to release heat into said hot food enclosure;

second cover means adapted to be disposed on said tray so as to overlie a second region of the upper surface of said tray to define, along with said first region, a cold food enclosure; and

a heat absorbing insert carried by said tray in the second region of said surface of said tray or by said second cover means to absorb heat from said cold food enclosure, whereby said respective enclosures may be maintained at their respective hot and cold temperatures respectively by preheating and prechilling said inserts.

4,182,406

SOLAR ENERGY SYSTEM FOR HEATING AND COOLING OF BUILDINGS UTILIZING MOIST AIR CYCLES

Edward M. Holbrook, 1012 Charity Dr., Virginia Beach, 23455, and Joseph J. Wallace, 1212 King Arthur Dr., Chesapeake, Va. 23323

Filed Feb. 17, 1978, Ser. No. 878,510

Int. Cl.[2] F25B *29/00*

U.S. Cl. 165—48 S **6 Claims**

1. A heating and cooling system for a building structure utilizing solar energy, comprising:

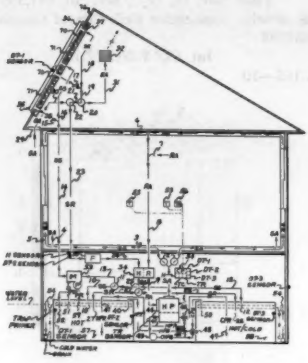
a solar energy collector mounted exteriorly of said building structure in a position to absorb solar energy;

duct means to selectively carry heated circulatory fluid in the form of moist air from said solar energy collector to a first storage tank having a first body of water therein wherein said heated circulatory fluid passes across the surface of said first body of water to transfer heat thereto, and duct means to selectively return cooled circulatory fluid in the form of moist air from said first storage tank to said solar collector;

branch duct means to selectively and alternatively carry heated circulatory fluid in the form of moist air from said solar energy collector to a second storage tank having a second body of water therein wherein said heated circulatory fluid passes across the surface of said second body of water to transfer heat thereto, and branch duct means to selectively and alternatively return cooled circulatory fluid in the form of moist air from said second storage tank to said solar collector;

means operable for maintaining a flow of circulatory fluid between said first storage tank and said solar energy collector and alternatively between said second storage tank and said solar energy collector;

means alternatively operable when said solar energy collector is not absorbing solar energy to allow cool air to be extracted from the ambient atmosphere exterior of said building structure to pass over the surface of said second body of water in said second storage tank and extract heat



therefrom and then return to the ambient atmosphere exterior of said building structure;

a heat pump unit having a water coil and an air coil;

means for passing a flow of heated water drawn from at least said first body of water in said first storage tank through said heat pump unit and at a lower temperature back to at least said first storage tank, said heat pump unit being concurrently operable to transfer heat extracted from said flow of water from said water coil thereof to said air coil thereof thence into a supply system incorporated in said building structure for heating the interior of said building structure; and,

means for passing a flow of cooled water drawn from said second body of water in said second storage tank through said heat pump unit and at a higher temperature back to said second storage tank, said heat pump unit being concurrently operable to extract heat from said building structure supply system by means of said air coil thereof and transfer heat exhausted from said building structure supply system to said water coil thereof and thence to said flow of water returning to said second storage tank.

4,182,407

TUBE SHEET COMPRISING TWO INTERSPACED SHEET MEMBERS AND HEAT EXCHANGER COMPRISING AT LEAST ONE SUCH TUBE SHEET

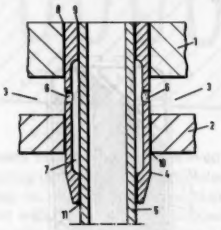
Harry Lagerwerf, Rotterdam, and Ronald Versluis, Alphen aan de Rijn, both of Netherlands, assignors to B. V. Neratoom, The Hague, Netherlands

Filed Oct. 19, 1977, Ser. No. 843,419

Claims priority, application Netherlands, Oct. 21, 1976, 7611676

Int. Cl.[2] F28F *9/04*

U.S. Cl. 165—70 5 Claims



1. A header assembly for a heat exchanger including two spaced tube sheet members provided with at least one pair of aligned bores therethrough, a tube section extending through each pair of aligned bores, and a sleeve surrounding each tube section in the space between the sheet members, the sleeve being sealed to both sheet members and both ends of the sleeve being sealed to the exterior of said tube section, the internal surface of the sleeve being spaced from the external surface of the tube section to provide an internal chamber therebetween, and the sleeve wall having at least one opening intermediate the ends of the sleeve for communicating the internal chamber with the space between the sheet members, wherein the improvement comprises at least one end of said sleeve extending through the bore in the corresponding sheet member, said one end being sealingly attached to the exterior of said tube section at a location spaced from said sheet member on the side opposite the space between the sheet members, whereby said internal chamber extends beyond at least one of the sheet members to avoid warping during assembly.

4,182,408

MULTILAYERED TUBE SHEET ASSEMBLY FOR HEAT EXCHANGERS

Walter Laber, Deggendorf, Fed. Rep. of Germany, assignor to Deggendorfer Werft und Eisenbau GmbH, Deggendorf, Fed. Rep. of Germany

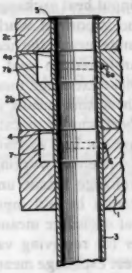
Filed Feb. 28, 1978, Ser. No. 882,183

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1977, 2708696

Int. Cl.[2] F28F *9/16*

U.S. Cl. 165—70 10 Claims

1. A multilayered tube sheet construction for heat exchangers, particularly those utilizing immiscible fluid heat exchange media, comprising a tube sheet base plate, a plurality of heat exchanger tubes extending along at least a portion of their length in sealed fluid-tight engagement through said tube sheet base plate, means defining within said base plate a series of internal ducts extending in flow communication with the exterior of said tubes in the vicinity of said portion of the length thereof in sealed engagement with said base plate, said tubes extending at their ends to project beyond said base plate, and a tube sheet cover plate extending over said tube sheet base plate and being rigidly connected thereto, said cover plate having said projecting ends of said tubes fixedly attached thereto, with said ducts being in flow communication with the exterior of said base plate to permit outflow therefrom of heat exchange media entering said ducts due to leakage, said tube sheet cover plate being produced by being built up by means of a welding process, said series of internal ducts having therein seals cover-



ing said ducts on the side thereof proximate said tube sheet cover plate.

4,182,409

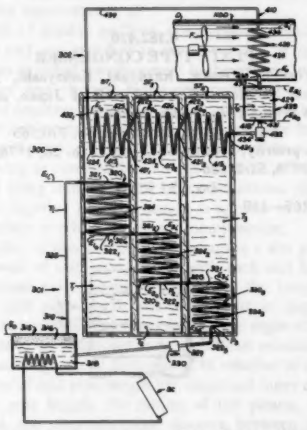
HEAT TRANSFER SYSTEM

Glen P. Robinson, Jr., 1050 Mt. Paran Rd., NW., Atlanta, Ga. 30327

Division of Ser. No. 615,343, Sep. 22, 1975, Pat. No. 4,119,143. This application Mar. 2, 1978, Ser. No. 882,655

Int. Cl.[2] F28D *21/00*

U.S. Cl. 165—104 S 7 Claims



1. A heat transfer system comprising:

a heat source generating a heated output;

a heat sink means for receiving heat including first and second heat storage means

a working fluid having a prescribed vaporization temperature and pressure range;

an input heat exchange means carrying the working fluid therein in a heat exchange relationship with said heat source to cause said heat source to vaporize said working fluid in said input heat exchange means, said input heat exchange means located at an input elevation; and

an output heat exchange means operatively connected to said input heat exchange means for receiving vaporized working fluid from said input heat exchange means, and for returning condensed working fluid to said input heat exchange means, said output heat exchange means placing the vaporized working fluid in a heat exchange relation-

ship with said heat sink means, and said output heat exchange means located at an output elevation higher than said input elevation so that the heat transferred to the working fluid in said input heat exchange means vaporizes the working fluid, the vaporized working fluid rises to said output heat exchange means, the heat in the vaporized working fluid is transferred to said heat sink means through said output heat exchange means as long as the temperature of said heat sink means is lower than the temperature of said heat source to cause the vaporized working fluid in said output heat exchange means to condense whereupon the condensed working fluid flows back to said input heat exchange means under the force of gravity for revaporization in said input heat exchange means, said output heat exchange means including a first output heat exchanger for receiving vaporized working fluid from said input heat exchange means and placing the vaporized working fluid in a heat exchange relationship with said first heat storage means, and a second output heat exchanger serially connected to said first output heat exchanger for receiving working fluid from said first output heat exchanger and placing the working fluid in a heat exchange relationship with said second heat storage means, said second output heat exchanger connected to said input heat exchange means so that condensed working fluid flows out of said first output heat exchanger to said second output heat exchanger and flows from said second output heat exchanger back to said input heat exchange means under the force of gravity for revaporization of said working fluid in said input heat exchange means.

4,182,410

PLATE TYPE CONDENSER

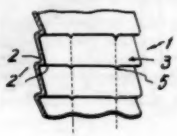
Keido Yoshida, Osaka; Kazuyuki Kobayashi, Nara, and Hiroyuki Sumitomo, Takatsuki, all of Japan, assignors to Hisaka Works Ltd., Osaka, Japan

Filed Feb. 22, 1977, Ser. No. 770,565

Claims priority, application Japan, Feb. 28, 1976, 51-21554; Feb. 28, 1976, 51-21556

Int. Cl.² F28B 9/08

U.S. Cl. 165—110 **3 Claims**



1. A rectilinear plate type condenser having a condensing and heat transmitting plate surface along which a steam condensate flows downwardly in the form of a film, said plate surface having a plurality of vertically spaced, horizontal top portions formed therein, each top portion being connected to the next succeeding downwardly spaced top portion by a downwardly and outwardly inclined surface portion thereby forming a step portion at the lower end of each downwardly and outwardly inclined surface portion along said plate surface, said downwardly and outwardly inclined surface portions being horizontally spaced whereby the condensate formed on each inclined surface portion of said plate surface will freely fall from the lower end of each downwardly and outwardly inclined surface portion downwardly to the next step portion at the lower end of the next succeeding downwardly and outwardly inclined surface portion until the collected condensate reaches the lowermost end of the heat transmitting surface.

4,182,411

PLATE TYPE CONDENSER

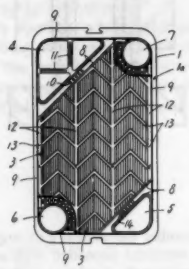
Hiroyuki Sumitomo, Takatsuki; Katsutoshi Fukami; Kazuyuki Kobayashi, both of Nara; Masafumi Doi, Daito; Kenzo Kawanishi, Yao, and Keido Yoshida, Osaka, all of Japan, assignors to Hisaka Works Ltd., Osaka, Japan

Filed Dec. 15, 1976, Ser. No. 750,909

Claims priority, application Japan, Dec. 19, 1975, 50/152364; Feb. 28, 1976, 51/21550; Feb. 28, 1976, 51/21551; Feb. 28, 1976, 51/21552; Feb. 28, 1976, 51/23684[U]; Feb. 28, 1976, 51/23685[U]; Feb. 28, 1976, 51/23686[U]; Mar. 1, 1976, 51/22488

Int. Cl.² F28B 9/08

U.S. Cl. 165—110 **9 Claims**

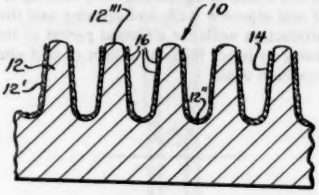


1. A rectilinear plate type condenser construction comprising two types of heat transmitting plate elements arranged in side by side relationship to define alternate passageways therebetween, one passageway being for the passage of a cooling liquid therethrough and the other for the passage of steam therethrough in countercurrent flow to the cooling liquid so that the steam will be condensed on the heat transmitting surface of the steam side of one of the transmitting plate elements, each of said plate surfaces having a plurality of first vertical channels extending in right angle relationship to the top edge of the plate element and in widely spaced, lateral relationship to one another formed thereon, a plurality of vertically spaced, inclined channels formed therein between said first channels with the lower end of each of said inclined channels merging into at least one of said first vertical channels, and a plurality of laterally spaced second vertical grooves formed thereon between each of said first widely spaced vertical channels in parallel relationship thereto, said plurality of second vertical channels extending between and connecting one inclined channel to the next succeeding inclined channel, said vertical and inclined channels forming a condensate discharging means for each given region on each of the condensing and heat transmitting plate surfaces of each plate element.

4,182,412
FINNED HEAT TRANSFER TUBE WITH POROUS BOILING SURFACE AND METHOD FOR PRODUCING SAME

Ming S. Shum, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 9, 1978, Ser. No. 867,856
Int. Cl.[2] F28F 13/18
U.S. Cl. 165—133 6 Claims

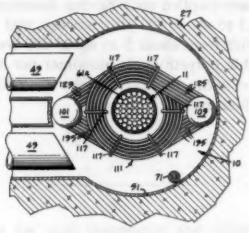


1. A metal finned tube having an improved boiling surface comprising a coating including an electroplated metal portion, said coating being on the side surface portions and root portions of its fins but with the metallic tip portions of its fins being devoid of said coating, the coating including a large number of powder-like conductive particles which are either completely encapsulated by the electroplated metal portion or completely encapsulated except for a point of contact between said conductive particles and the metal surface of the fins or tube, said conductive particles causing said coating to be textured.

4,182,413
RADIAL FLOW HEAT EXCHANGER

John A. Kissinger, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Dec. 23, 1976, Ser. No. 753,898
Int. Cl.[2] F28D 7/10
U.S. Cl. 165—163 13 Claims



1. A structurally self-supporting heat exchanger tube bundle assembly of annular configuration, comprising

an elongated inlet header conduit forming an internal passage for communicating a heat exchanger fluid into the tube bundle assembly,

an elongated outlet header conduit arranged parallel with said inlet header conduit, said outlet header conduit forming an internal passage through which the heat exchanger fluid exits the tube bundle assembly,

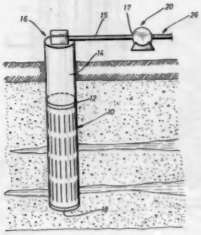
a multiplicity of helically shaped heat exchanger tubes forming an annular tube bundle for the tube bundle assembly, said helical tubes each being formed about a common axis parallel with said inlet and outlet header conduits and including one full loop and one partial loop with its opposite ends being secured in fluid communication with said inlet and outlet header conduits respectively, at least some of said helical tubes being arranged with said partial loops in diametric opposition to the partial loops of other of said helical tubes, and

tie means for interconnecting adjacent portions of helical tubes in said annular tube bundle to provide increased structural strength and resistance to vibration.

4,182,414
WATER SCREEN

Larry D. Sanders, 114 E. Limit St., Madisonville, Tex. 77864, and Marvin E. Gilbert, Rte. 2, Box 609, Cleveland, Tex. 77327

Continuation-in-part of Ser. No. 734,280, Oct. 20, 1976, abandoned. This application Aug. 12, 1977, Ser. No. 824,238
Int. Cl.[2] E21B 43/08
U.S. Cl. 166—74 2 Claims



1. In a system for withdrawing water from a subterranean water table wherein a source of negative pressure is interconnected with a water screen to draw water upwardly through the screen, the improvement of:

(a) a length of plastic, resilient, compressible, tubular pipe with an end cap attached to the lower end of said pipe length, as oriented for placement in the ground, and with the other end thereof being interconnectable to said source of negative pressure, the wall of said length of pipe being of a thickness such that negative pressure from said source will create an inward compression of the wall, said pipe having an outer surface for placement in contact with soil and being internally free of any additional pipe such that the negative pressure source is applied to the inner pipe surface to effect the inward compression;

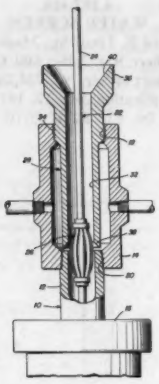
(b) a plurality of liquid inlet slot openings in a slot grouping in the wall of said pipe length, with each slot having a longitudinal axis essentially parallel to the longitudinal axis of said pipe length and inclined at an angle with respect to a radius of said pipe length, the angle of inclination relative to a pipe radius being at least essentially 10°, with said angle being determined in relation to the wall thickness of said pipe length, the inner and outer diameter of said pipe length, the nature of the plastic, resilient material, the circumferentiel distance between adjacent slots and the width of each slot such that when negative pressure providing suction is created within said pipe length, the material of said pipe length compresses causing the circumferential distance between the walls of said slots to reduce thereby permitting the flow of water through said slots and into said pipe length, but excluding debris therefrom, such that the pipe provides variable filtration by variable compression which is dependent upon the negative pressure established internally of the pipe and based upon the size of the particulate matter surrounding the pipe, the slots in each slot group being spaced in a circumferential array with the number of slots in each array being selected to optimize filtration without severely and adversely affecting the structural integrity of the pipe, the slots being spaced from each other such that the slots' center-to-center distance is greater than about 0.25 inches.

4,182,415

TUBING STRING ROD RUNNING NIPPLE

Odis M. Harland, deceased, late of Casper, Wyo., and by Shirley J. Harland, executrix, 1615 Holly, Casper, Wyo. 82601

Filed Jun. 30, 1978, Ser. No. 921,222
Int. Cl.[2] E21B *33/03*
U.S. Cl. 166—85 **3 Claims**



1. In combination with a well tubing string including an upper tubing string section, a tubular pumping tee having internally threaded upper and lower vertically spaced and registered bores as well as a central interior into which said bores open of transverse interior dimensions greater than the diameters of said bores, the upper end of said upper section being externally threaded and threaded into said lower bore, an upstanding tubular running nipple having open upper and lower ends and defining an upstanding cylindrical bore extending therethrough of a diameter substantially equal to the inside diameter of said section, the lower end of said nipple being loosely telescoped downwardly into said tee through said upper bore with the lower end of said cylindrical bore aligned with and positioned at least closely adjacent the upper end of said section, the upper end portion of said nipple including a diametrically enlarged externally threaded portion removably threaded in said upper bore, the upper end of said cylindrical bore being chamfered so as to be upwardly flared.

4,182,416

INDUCED OIL RECOVERY PROCESS

Joseph C. Trantham, Bartlesville, Okla., and Robert F. Meldau, Santa Maria, Calif., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 27, 1978, Ser. No. 890,755
Int. Cl.[2] E21B *43/16, 47/10*
U.S. Cl. 166—245 **12 Claims**

1. In an oil recovery process wherein a subterranean formation is penetrated by a plurality of production wells and a plurality of fluid injection wells, and wherein injection fluid is injected via said fluid injection wells and fluid is produced from the formation via the production wells, and wherein a "thief" region between a first one of said fluid injection wells and a first one of said production wells adjacent thereto results in excessive flow of injection fluid through the "thief" region in comparison to injection fluid flow through surrounding regions between the first one of said injection wells and other production wells adjacent thereto, the improvement comprising:

(a) shutting in said first one of said production wells for a first period of time while continuing to inject fluid via said plurality of injection wells; and

(b) at the end of said first period of time, shutting in said first one of said injection wells and opening said first one of said production wells for a second period of time while continuing to inject fluid via others of said plurality of fluid injection wells.

4,182,417

METHOD FOR CONTROLLING PERMEABILITY OF SUBTERRANEAN FORMATIONS

Charles J. McDonald, Midland, Mich.; John V. Van Landingham, Sapulpa, Okla., and Steven P. Givens, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 8, 1977, Ser. No. 813,903
Int. Cl.[2] E21B *33/138, 43/22*
U.S. Cl. 166—295 **8 Claims**

1. In a hydrocarbon recovery method wherein a production well bore penetrates a subterranean formation having at least hydrocarbon-bearing stratum and adjacent thereto a least one stratum bearing an aqueous fluid, the improvement which comprises introducing into said subterranean formation via the production well bore a fluid medium containing discrete, spheroidal microgels of a water-swellable or water-swollen, crosslinked polymer of ethylenically unsaturated water-soluble monomer(s) in an amount sufficient to reduce the aqueous fluid permeability of the porous formation, said microgels in at least a partially water-swollen state having diameters in the range from about 0.5 to about 200 micrometers, said polymer being crosslinked with from about 5 to about 200 weight parts of a copolymerizable polyethylenic monomer per million parts of total monomers of the polymer, thereby controlling the flow of the aqueous fluid into the well bore.

4,182,418

METHOD FOR PERFORATING WATER WELL PIPE CASINGS

Edward M. Jannsen, 2855 NW. Saltzman Rd., Portland, Oreg. 97229

Filed Sep. 20, 1977, Ser. No. 834,908
Int. Cl.[2] E21B *43/112*
U.S. Cl. 166—298 **1 Claim**

1. The method of perforating and developing a well having a casing comprising the steps of:

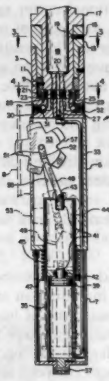
inserting a tool having a perforator and a source of pressure fluid thereon into the well;

piercing into the lower end of the well casing wall a plurality of separate non-connected perforations;

holding the perforator in engaging position with at least one perforation in the well casing;

and developing the well after perforation by discharging

pressurized air from the tool at a position above the perforations while the perforator is in engagement with the

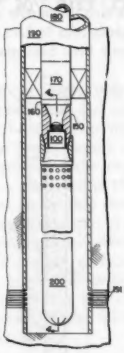


well casing, so that sand, mud and debris are forced from the well while the tool remains within the well.

4,182,419
DOWNHOLE SURGE TOOLS

Robert D. Yeates, 3217 High Sky Dr., Midland, Tex. 79703

Filed Sep. 29, 1978, Ser. No. 947,049
Int. Cl.[2] E21B *21/00*
U.S. Cl. 166—318 **7 Claims**



1. Apparatus for well completion and related downhole drilling operations, wherein the well includes a bore and casing therefor, tubing within the casing, and a production packer for disposition between the tubing and casing, comprising:

(A) a tubular nipple, having an upper end and a lower end, the upper end of the nipple having connection with the downhole end of the tubing, said nipple defining an internal abutment adjacent the lower end thereof,

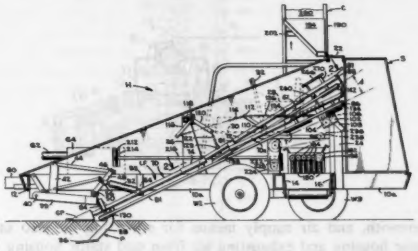
(B) a surge plug, movably disposed within the lower end of the nipple, said plug having an uppermost portion which is of lesser diameter than the lowermost portion thereof, said uppermost portion, when seated in the nipple, extending beyond the abutment means of said nipple and defining therein a circumferential relief groove, said groove being exposed to the interior of said nipple, said lowermost portion defining an abutment corresponding to the abutment of said nipple whereby said surge plug may be restrained against movement into the tubing upon the influence of fluid pressures thereagainst, said lowermost portion of the plug defining therein plural courses, said courses being in connection with said relief groove and communicating the well bore interior therewith;

(C) sealing means disposed about the uppermost portion of the surge plug for contact with the inner circumference of the nipple, said sealing means being disposed above said relief groove.

4,182,420
ROOT CROP HARVESTER AND TRIMMER

Russell J. Hurliman, Hoopeston, and Frank F. Scribner, Batavia, both of Ill., assignors to FMC Corporation, San Jose, Calif.

Filed Jan. 23, 1978, Ser. No. 871,300
Int. Cl.[2] A01D *27/04*
U.S. Cl. 171—38 **7 Claims**



1. A field harvester and trimmer for root crops having foliage tops growing from the crowns of the roots, such as carrots, beets or the like, said harvester being of the type comprising a wheeled vehicle having a frame mounting a plow share for loosening the soil around the roots, a harvesting frame extending upwardly and rearwardly from the ground, said harvesting frame having a rearwardly extending, upwardly inclined lifter frame, two laterally opposed endless lifter belts in said lifter frame having adjacent reaches extending from the plow share to the rear of the harvester for grasping and lifting the tops of the plants, means for driving said lifter belts, trimming means at an upper rearward portion of said harvesting frame for topping the roots, and means for collecting the topped roots; the improvement wherein said lifter belt frame has a gauging belt frame diverging upwardly and rearwardly from an intermediate portion of said lifter belt frame, laterally opposed gauging belts mounted on said gauging belt frame and disposed above rearward portions of said lifter belts, said gauging belts extending upwardly and rearwardly from said lifter belts at an acute angle to and above said lifter belts for grasping the root crop tops and progressively pulling the tops up through the lifter belts to bring the crowns of the roots against the undersides of said lifter belts, said lifter belts having continuous unobstructed under surfaces up to said trimming means, said trimming means comprising knife means disposed below, substantially parallel to and closely adjacent to said lifter belts for slicing off the crowns of the roots, and means for driving said lifter and gauging belts.

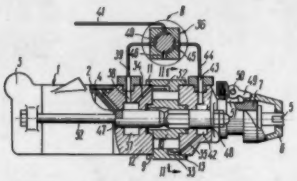
4,182,421
PNEUMATIC ROCK DRILL

Anatoly I. Zubarev; Lev F. Osipovsky, and Stanislav V. Shipov, all of Alma-Ata, U.S.S.R., assignors to Institut Gornogo Dela Akademii Nauk Kazakhskoi SSR, U.S.S.R.

Continuation of Ser. No. 676,044, Apr. 12, 1976, abandoned, which is a continuation of Ser. No. 512,308, Oct. 4, 1974, abandoned, which is a continuation of Ser. No. 391,251, Aug. 24, 1973, abandoned. This application Dec. 5, 1977, Ser. No. 857,617
Int. Cl.[2] E21B *1/02*
U.S. Cl. 173—105 **2 Claims**

1. A reversible pneumatic rock drill comprising an impact

unit including an impact housing, a hammer piston disposed in said impact housing, air distributing means for reciprocating said hammer in said impact housing, an air distributor housing at one end of said impact unit, said impact piston having a forward end portion defining an impact hammer disposed in said air distributor housing, a front head assembly including a front head housing, a drill bit shank disposed in said front head housing, said drill bit shank being coaxial with said impact hammer and having a rear end disposed adjacent a forward end of said impact hammer to be struck by said impact hammer during reciprocatory movements of said impact piston, pneumatic motor means for reversibly rotating said drill bit shank including a stator housing disposed between and connecting said air distributor housing and said front head assembly, a rotor disposed within said stator housing, said rotor embracing and being directly attached to said drill bit shank for rotation



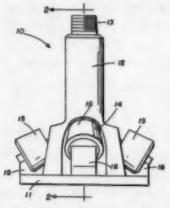
therewith, and air supply means for admitting air into said stator housing and exhausting air from said stator housing to effect rotation of said rotor within said stator housing, said air supply means including first air conduit means formed in said air distributor housing and having a first annular chamber defined by a peripheral surface of said impact hammer and a surface of said air distributor housing, second air conduit means formed in said front head assembly and having a second annular chamber defined by a peripheral surface of said drill bit shank and a surface of said front head assembly and reversible valve means for selectively directing a source of pressurized air into said stator housing through one of said first and second conduit means and to leave said stator housing through the other of said first and second conduit means whereby the direction of rotation of said rotor and said drill bit shank can be reversed.

4,182,422

LARGE DIAMETER BIT WITH BRIDGE MOUNTED DRIVE STEM

Thomas F. Youngblood, De Soto; William C. Saxman, Irving, and Gerald F. Wilemon, Arlington, all of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 6, 1978, Ser. No. 949,355
Int. Cl.[2] E21C *23/00*
U.S. Cl. 175—53 **3 Claims**



1. A large diameter bit for boring a large diameter hole by disintegrating the earth formations surrounding a pilot hole, comprising.

a main body portion including a main plate;

a pair of inner cutter saddles mounted on said main body portion, said inner cutter saddles located opposite each other on said main body portion and positioned adjacent each other;

a multiplicity of additional cutter saddles mounted on said main body portion, said pair of inner cutter saddles and said additional cutter saddles positioned on said main body portion to leave spaces between said inner cutter saddles and said additional cutter saddles;

a pair of inner rolling cutters mounted in said inner cutter saddles for contacting and disintegrating earth formations surrounding the pilot hole;

a multiplicity of additional rolling cutters rotatably mounted in said additional cutter saddles, said inner rolling cutters and said additional rolling cutters providing a straight cutter profile that extends in a uniform manner to said pilot hole;

a stem member; and

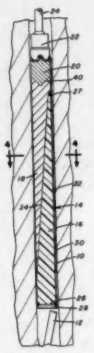
means connecting said stem member to said main body portion, said means including an arch on said stem member to bridge over said pair of inner cutters saddles and said pair of inner rolling cutters mounted in said inner cutter saddles and legs extending around said arch that extend into said spaces between said inner cutter saddles and said additional cutter saddles.

4,182,423

WHIPSTOCK AND METHOD FOR DIRECTIONAL WELL DRILLING

Timothy D. Ziebarth; Ray L. Hauser; James R. Thompson; John F. Harris; Michael P. Gibbons, all of Boulder County, Colo., and Guy C. Burton, Natrona County, Wyo., assignors to Burton/Hawks Inc., Casper, Wyo.

Filed Mar. 2, 1978, Ser. No. 882,581
Int. Cl.[2] E21B *7/06, 7/08*
U.S. Cl. 175—61 **52 Claims**



26. A whipstock tool for use in well holes to deflect a drill bit and offset a new hole from the original hole, the tool comprising a non-metallic wedge-shaped body having a tapered face to guide and deflect a drill bit, the tapered face being formed from a tough, impact resistant, resilient material so that the crushing action of the drill bit will be absorbed while the drill bit is being guided and deflected.

44. A method for changing the direction of an earth drill hole to form a new offset drill hole, the method comprising:

(a) coating the outside surface of a wedge-shaped drill bit deflector with a suitable adhesive material;

(b) placing the wedge-shaped deflector in proper position in said drill hole;

(c) deforming a material along an angled face of the wedge-shaped deflector so as to laterally compress the outside

surface of the deflector against the surface of said drill hole;

(d) bonding the deflector to the surface of the drill hole with the adhesive material; and

(e) drilling out the deformed material by moving a rotating drill bit downward along the face of the secured deflector and initiating a new drill hole in an offset direction from the original drill hole.

4,182,424

DRILL STEEL CENTRALIZER

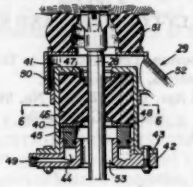
Sören P. Prebensen, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Feb. 28, 1978, Ser. No. 882,137

Claims priority, application Sweden, Mar. 3, 1977, 7702346

Int. Cl.[2] E21C *9/00*

U.S. Cl. 175—211 **15 Claims**



1. In a rock drill apparatus comprising an elongate structure; a rock drill; a cradle carrying the rock drill and mounted on said elongated structure to be axially movably guided therealong; motor means coupled to the cradle for feeding the cradle along said elongate structure; and a drill stem centralizer mounted on the front end of said elongate structure;

the improvement wherein said drill stem centralizer comprises:

an annular housing (40); a sleeve (46) of an elastomeric material rigidly supported in the annular housing, an annular surface of said annular housing providing a firm radial support for the outer surface of said sleeve, said sleeve surrounding a portion of the length of the drill stem and normally having a clearance to the drill stem; and

a pressure fluid actuated piston (45) coupled to said sleeve for axially compressing said sleeve to cause said sleeve to expand inwardly, said annular surface of said housing radially supporting the outer surface of said sleeve to force said sleeve to expand inwardly during said axial compression thereof to reduce said clearance and firmly engage the drill stem to centralize the drill stem when said sleeve is compressed axially.

4,182,425

REAMER

William R. Garrett, Houston, Tex., assignor to Smith International, Inc., Houston, Tex.

Filed May 23, 1977, Ser. No. 799,770

Int. Cl.[2] E21B *9/08*

U.S. Cl. 175—228 **104 Claims**

1. A wall contacting apparatus useful in earth boring by the rotary method, comprising:

a body having first and second aligned end portions,

thread means at a terminus of each end portion for making a rotary shouldered connection with an adjacent drill string member,

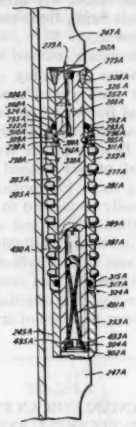
each end portion being provided with a plurality of sockets in its outer periphery,

a plurality of blocks disposed one in each socket and having side walls generally correlative to those of said sockets and making a tight fit therewith, each block having a front facing radially outwardly of said end portion and a back facing radially inwardly,

a plurality of shafts each supported at each end by one of the blocks in different ones of said end portions,

a roller rotatably mounted on each shaft, and

tool cooperation means carried by the apparatus for cooperation with a tool for forcing out the blocks when it is desired to replace the rollers,



said tool cooperation means comprising tool passage means each providing an opening extending from the surface of one of said end portions of the body which is adjacent the socket to behind the bottom of the socket,

each said opening including a portion of constant depth extending away from the side of the block farthest from the rollers and an inclined portion sloping upwardly from said portion of constant depth to said surface.

4,182,426

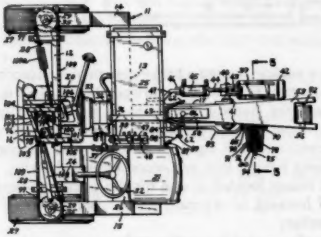
TRACTOR UNIT FOR IMPLEMENTS AND VEHICLES

Abram P. Balzer, Box 191, Mountain Lake, Minn. 56159

Filed Jan. 30, 1978, Ser. No. 873,416

Int. Cl.[2] B62D *7/06;* **B60D** *1/00, 1/10*

U.S. Cl. 180—12 **10 Claims**



1. A tractor unit comprising:

(a) a frame having opposite side portions and front and rear ends;

(b) a pair of laterally spaced steerable wheels;

(c) means mounting said wheels at said opposite side portions and at one end of said frame for rotation on generally horizontal axes and for steering movements on generally vertical axes, and including generally vertical pivot shafts, one for each of said wheels;

(d) means for supporting the other end of said frame;

(e) hitch means at one of the ends of said frame for hitching said frame to a vehicle;

(f) and means for imparting steering movements to said wheels, comprising:

(i) a rotary steering shaft operatively carried by said frame on a fixed axis;

(ii) toothed wheels on each of said pivot shafts;

(iii) a pair of primary toothed wheels one operatively rotatably carried by said frame on a fixed axis intermediate said pivot shafts, the other one of said primary toothed wheels being fixed on said steering shaft for rotation therewith;

(iv) a pair of secondary toothed wheels;

(v) shiftable means journaling said secondary toothed wheels about axes spaced apart in a direction transversely of said frame and movable with each other in directions generally transversely of said frame;

(vi) an endless flexible power transmission member entrained over all of said toothed wheels;

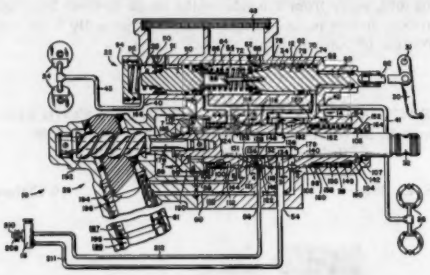
(vii) and shifting means comprising a pitman arm having one end pivotally connected to one of said pivot shaft mounted toothed wheels and an opposite end operatively connected to said shiftable means and responsive to rotation of said toothed wheels for imparting shifting movements to said shiftable means to rotate one of said pivot shafts to a greater angular extent than the other thereof in a given direction of pivotal movement of said pivot shafts.

4,182,427

CONTROL MECHANISM FOR AN INTEGRATED BRAKE AND STEERING SYSTEM

Jerome T. Ewald, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 12, 1977, Ser. No. 832,135
Int. Cl.[2] B62D *5/08*
U.S. Cl. 180—148 **29 Claims**



13. In a vehicle having a brake system and a steering system, a control means for providing an operational assist to the brake system and the steering system from a source of pressurized fluid in response to corresponding independent operator brake and operator steering inputs, said control means comprising:

a housing having first and second bores therein;

piston means located in said first bore and cooperating with said housing to separate a first chamber from a second chamber;

spool valve means located in said second bore and cooperating with said housing to establish a brake actuation chamber in the second bore, said spool valve means having a series of lands and passages for directing the communication of pressurized fluid from said source to the second chamber and to a rack member in the steering system;

brake linkage means responsive to an operator brake signal for moving said piston means and developing a brake actuation signal, said brake actuation signal being communicated to said brake actuation chamber for moving said spool valve and allowing proportional communication of pressurized fluid from said source to said second chamber, said pressurized fluid in said second chamber acting on said piston means to provide a power assist to the operator brake signal; and

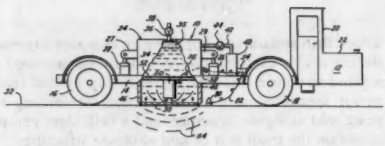
steering linkage means rotating relative to said spool valve means in response to an operator steering signal to allow flow of pressurized fluid from said source to create a pressure differential across the rack member, said pressure differential moving the rack to provide a power assist in the operation of the steering system, said movement of the rack member being transmitted into rotation of said spool valve means to proportionally reduce the restrictive flow condition as said rack member moves to a position corresponding to said operator steering signal, said spool valve means eliminating the restricted flow condition and eliminating said pressure differential to maintain said rack member in said corresponding position when the rotation of said spool valve means corresponds to the rotation of said steering linkage means.

4,182,428

HYDRAULICALLY-COUPLED, LAND SEISMIC SIGNAL SOURCE

Carl H. Savit, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Apr. 17, 1978, Ser. No. 896,942
Int. Cl.[2] G01V *1/04*
U.S. Cl. 181—114 **3 Claims**



1. A portable vehicle-mounted seismic signal generator for use in environmentally sensitive areas for generating in the earth a P-wave, having an initial negative pulse, a means for lowering said seismic signal generator below said vehicle to press said generator into ground contact to provide a preloading force and for raising said generator for transport between locations, comprising in combination:

a closed tank, having a sealed cover, mounted on said vehicle for containing a volume of water to provide a natural hydrostatic head, said tank having a lower retractable wall for contacting the ground;

means for applying to said volume of water and to said retractable wall an artificial hydrostatic head to augment the natural hydrostatic head in said tank;

an imploder mounted in said tank, hydraulically coupled to said volume of water;

a control means for actuating said imploder in cooperation with the potential energy provided by the augmented hydrostatic head, so that said imploder impulsively reduces the pressure on said retractable wall to inject the desired negative-going initial pulse into the ground with minimal adverse earth compaction and environmental disturbance.

4,182,429

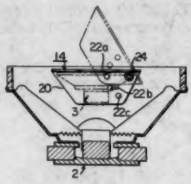
LOUD-SPEAKER SYSTEM

Hiroshi Senzaki, Hachioji, Japan, assignor to Kabushiki Kaisha Senzaki Seisakusho, Hachioji, Japan

Filed Feb. 22, 1978, Ser. No. 880,190
Claims priority, application Japan, Dec. 29, 1977, 176834[U]
Int. Cl.[2] H05K *5/00*; **H04R** *13/02*
U.S. Cl. 181—144 **6 Claims**

1. A loud-speaker system comprising at least a first loud-speaker means for low sounds and at least a second loud-speaker means for high sounds arranged substantially coaxially with respect to said first loud-speaker in the rest position of the

second loud-speaker said system further comprising pivotable mounting means pivotably mounting said loud-speaker means for high sounds relative to the frame of said loud-speaker means for low sounds so as to permit pivoting of said loud-

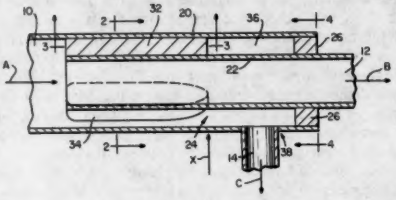


speaker means for high sounds from said rest position and thereby varying the direction of the high sounds from said loud-speaker means for high sounds, said mounting means being disposed substantially in the plane of the mouth of said first loud-speaker.

4,182,430
BRANCH TAKE-OFF AND SILENCER FOR AN AIR DISTRIBUTION SYSTEM

Dimiter Gorchev, Boston, Mass., and Karl U. Ingard, Kittery Point, Me., assignors to Mitco Corporation, Somerville, Mass.

Filed Sep. 20, 1978, Ser. No. 944,133
Int. Cl.[2] E04F *17/04*
U.S. Cl. 181—224 **13 Claims**



1. Apparatus for coupling an airstream from an input duct to an output duct and one or more branch ducts, said input and output ducts having a common central axis and similar cross-sectional shapes at the ends to be coupled and said input duct having a larger cross-sectional area than said output duct, and said branch ducts having branch axes at the end to be coupled to said input duct, said branch axes being angularly offset from said common central axis, comprising:

A. an outer section having a cross-section substantially the same as the cross-section of said input duct, said outer section having a central axis coaxial with said common axis and said outer section being coupled at one end to said end of said input duct,

B. an inner section having a cross-section substantially the same as the cross-section of said output duct, said inner section having a central axis coaxial with said common axis, and said inner section being coupled at one end to said end of said output duct and extending into said outer section to define a shell region between said inner and outer sections,

C. a plug means for sealing the end of said shell region adjacent to said output duct,

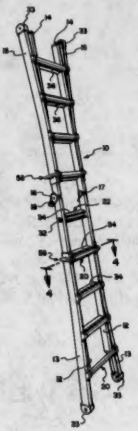
D. channel means for establishing a plurality of channels in said shell region, said channels extending from a point near the end of said shell region adjacent to said input duct to an intermediate point within said shell region, whereby the portion of said shell region between said intermediate point and said plug means forms a common plenum,

E. branch coupling means for coupling said plenum to said branch ducts.

4,182,431
COMBINATION EXTENSION AND STEP LADDER RUNGS THEREFOR

Harold R. Wing, Springville, Utah, assignor to Little Giant Industries Inc., American Fork, Utah

Filed Mar. 13, 1978, Ser. No. 885,837
Int. Cl.[2] E06C *1/18, 1/32*
U.S. Cl. 182—23 **1 Claim**



1. In a ladder having a first pair of side rails slidably mounted in telescopic relation within a second pair of side rails, a plurality of improved ladder rungs, each rung comprising:

a first tubular bar joined at the ends thereof to the side rails of said slidably mounted first side rail pair;

at least two flat stepping surfaces each of which is integrally joined at one end to said bar by a bracket formed between said bar and the flat stepping surface joined thereto, each said stepping surface being supported at the other end by a rod extending from the side rails of said first side rail pair through a bend formed in the end of said stepping surface, said stepping surfaces being essentially symmetrically angularly disposed between said first side rail pair such that at least one of said stepping surfaces will be essentially horizontally oriented whenever the ladder is placed in an upright position; and

a second tubular bar joined at the ends thereof to the side rails of said second side rail pair, the upper and lower surfaces of said second bar being configurated to form flat stepping surfaces that are essentially coplanar with the stepping surfaces joined to said first bar, said second bar being mounted to the second side rail pair so as to permit telescopic extension of the first side rail pair.

4,182,432
SUPPORT APPARATUS

Forrest T. Cossitt, 3017 Ruthland Rd., Richmond, Va. 23228

Filed Jun. 23, 1978, Ser. No. 918,420
Int. Cl.[2] F16M *11/00*
U.S. Cl. 182—151 **2 Claims**

1. A knock-down support apparatus comprised of interlocking legs and a T-section cross-beam, said legs having T-shaped cuts extending downwardly from the middle of and partially across the top thereof whereby upwardly extending leg projections are formed on opposite sides of said T-shaped cuts in the upper portion of said legs, and said T-section cross beam is correspondingly cut with slots extending upwardly from the

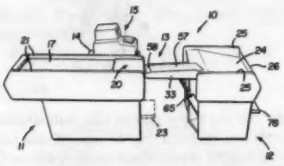
bottom of the vertical section and opposing notches on the sides of the horizontal section to interlockingly fit said upwardly extending projections in the horizontal section and overlappingly fit together along the vertically slotted portions of said legs.

4,182,433

CONVERTIBLE SINGLE-DOUBLE BELT CHECK-OUT COUNTER

Stephen W. Foster, North Java, N.Y., assignor to Almor Corporation, Warren, Mich.

Filed Dec. 23, 1977, Ser. No. 863,796
Int. Cl.[2] A47F *9/02*
U.S. Cl. 186—1 AA **9 Claims**



1. A check-out counter comprising:

a forward check-out module, having a merchandise supporting surface and a rear transverse edge portion, a separate rear bagging module having a merchandise receiving deck and a forward transverse edge portion, said forward check-out module and said rear bagging module being spaced apart;

a conveyor belt unit for bridging the space between the modules and interconnecting the rear transverse edge portion of the check-out module with the forward transverse edge portion of the bagging module;

said conveyor belt unit being formed of a pair of spaced apart horizontally axised rollers secured within a rigid frame, and an endless conveyor belt passing around the rollers;

power means for rotating one of the rollers for thereby driving the conveyor belt;

means for pivotally securing one end of the conveyor belt unit to its adjacent module transverse edge portion and releasable latch means for releasably securing the opposite end of said unit to its adjacent module transverse edge portion;

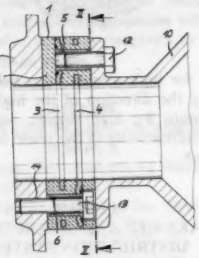
a conveyor belt unit counter-balancing strut comprising an elongated rod telescoped within an elongated cylinder and extending outwardly of one end of the cylinder, with a spring between the rod end located within the cylinder and the adjacent cylinder end and with the free ends of the rod and cylinder being pivotally connected to and extending between the conveyor belt unit and lower portion of the bagging module for providing a resistance against pivoting movement of the conveyor belt unit, whereby the conveyor belt unit may be hung downwardly from said pivot means for stowing in a non-use position and may alternatively be extended and secured between the modules in a use position for conveying merchandise from the check-out module to the bagging module deck.

4,182,434

OSCILLATION INSULATOR

Erich Munz, 1-Geber, Westrasse 11, 5204 Lohmar, Fed. Rep. of Germany

Continuation of Ser. No. 772,463, Feb. 28, 1977, abandoned.
This application Jul. 3, 1978, Ser. No. 921,189
Int. Cl.[2] F16F *7/00*
U.S. Cl. 188—1 B **8 Claims**



1. An oscillation insulator as a flange-type connection and supporting device to isolate sound without encountering any rotary movement, comprising in combination: two bodies arranged in axially spaced relationship to each other and to be connected to each other, disc-shaped means of viscous-elastic material interposed between said two bodies, first and second supporting disc means arranged in spaced relationship to each other in the axial direction of said two bodies and embedded in said disc-shaped means of viscous-elastic material, said first supporting disc means being arranged between one of said bodies and said second supporting disc means, said second supporting disc means being located between the other one of said bodies and said first supporting disc means, first rigid connecting means rigidly connecting said other one of said two bodies to said first supporting disc means, and second rigid connecting means rigidly connecting said one of said bodies to said second supporting disc means, said first and second connecting means forming a pull connection tensioned under pre-load by said viscous-elastic material whereby arising forces are compensated without any damage to the connection and supporting means.

4,182,435

CAM ACTUATED DISK BRAKE MECHANISM

Thomas F. Dadian, Santa Paula, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 6, 1978, Ser. No. 883,364
Int. Cl.[2] F16D *65/14*
U.S. Cl. 188—72.7 **5 Claims**

1. A brake mechanism for holding a brake disk against rotation comprising:

a housing;

a brake member mounted on said housing to move against and away from the brake disk;

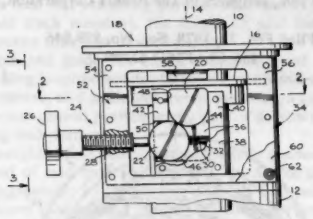
a camming member mounted on said housing to move transverse to the direction of movement of said brake member; and

means for advancing said camming member against said brake member to move said brake member into engagement with said brake disk;

both of said members formed of metal plates of substantially the same thickness and having edges;

said housing comprising a pair of housing parts having flat surfaces spaced apart slightly more than the thickness of

said metal plates that form said members of closely guide said members, and said members being slidably disposed



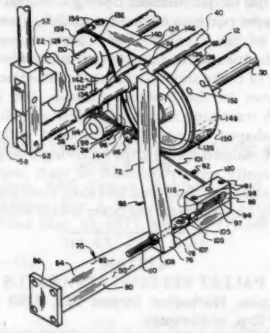
between said housing parts and free of pivotal connection to said housing and in direct edge contact with each other.

4,182,436

BRAKE APPARATUS FOR A SCREW MACHINE

Ronald A. Goertz, Wichita, Kans., assignor to Screw Machine Products, Inc., Wichita, Kans.

Filed Jan. 16, 1978, Ser. No. 869,685
Int. Cl.² F16D *49/10*
U.S. Cl. 188—77 R **4 Claims**



1. A brake apparatus operably connected to a drive shaft on a power machine structure to accurately cease rotation of said drive shaft, comprising:

(a) a brake assembly mounted in the power machine and connected to a brake drum member which is secured to said drive shaft;

(b) an actuator assembly connected to said brake assembly to selectively actuate same from brake release positions to brake applied positions with said brake drum member;

(c) said brake assembly includes 1) an actuator arm assembly connected to said actuator assembly for movement therewith, 2) a brake band assembly connected to said brake drum member operable to selectively retard rotation of said drive shaft and interconnected brake drum member, and 3) a support and linkage assembly connected between said actuator arm assembly and said brake band assembly being operable to operate said brake band assembly on actuation of said actuator assembly;

(d) said actuator assembly includes a connector rod having a portion thereof extended laterally of a sidewall of the power machine;

(e) a handle member connected to said portion and operable to selectively move said connector rod axially;

(f) said support and linkage assembly includes a main support body connected to said sidewall; a pulley member connected to said main support body; and a cable member having a midportion trained about said pulley member; and

(g) said actuator arm assembly includes a support arm member having one end secured by a connector coupling to said connector rod and another end connected to one end of said cable member with the other end of said cable member connected to said brake band assembly for actuation thereof on axial movement of said connector rod.

4,182,437

UNSTABLE DEVITRIFIABLE GLASSES AND FRICTION MATERIALS CONTAINING THEM

Gordon J. Roberts, and James H. Heasley, both of Shaker Heights, Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Filed May 8, 1978, Ser. No. 903,746
Int. Cl.² C03C *12/00*; F16D *69/02*
U.S. Cl. 188—251 A **24 Claims**

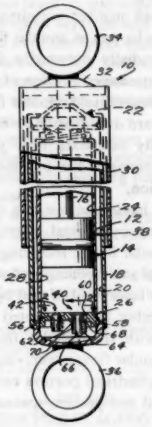
1. A glass adapted for use as a friction modifier for friction material which in use produces heat, said glass comprising a substantially amorphous, unstable, finely divided glass convertible in response to said heat to a devitrified, crystallized, friable, substantially non-smearing form, said glass being selected from a class of glasses consisting essentially of silicate, titanate, phosphate, aluminate, and borate glasses and mixtures thereof.

4,182,438

SHOCK ABSORBER WITH IMPROVED COMPRESSION VALVE ASSEMBLY

Jerome S. Pepi, North Attleboro, Mass., assignor to Maremont Corporation, Chicago, Ill.

Filed Apr. 10, 1978, Ser. No. 895,079
Int. Cl.² F16F *9/34*
U.S. Cl. 188—322 **3 Claims**



1. A shock absorber comprising:

a cylinder member;

a piston assembly having an axis aligned with the axis of said cylinder member and

a piston rod fixed to said piston assembly and extending axially therefrom outwardly of one end of said cylinder member disposed upwardly when said shock absorber is operatively mounted,

an intermediate tube surrounding said cylinder member the interior of which defines with the exterior of said cylinder member an annular reservoir chamber,

a seal assembly fixedly connecting the upper end of said cylinder member to the upper end of said intermediate

tube and slidably sealingly receiving said piston rod therethrough so as to define the upper end of a rebound chamber within said cylinder member the lower end of which is defined by the piston assembly and the volume of which is variable depending upon the position of sliding movement of said piston assembly within said cylinder member,

a base and end cap assembly fixedly connecting the lower end of said cylinder member and said intermediate tube so as to define the lower end of a compression chamber within said cylinder member the upper end of which is defined by the piston assembly and the volume of which is variable depending upon the position of sliding movement of said piston assembly within said cylinder member, said base and end cap assembly including a fixed base member;

hydraulic fluid filling said rebound and compression chambers and partially filling said reservoir chamber,

means on said piston assembly providing for the controlled restricted flow of hydraulic fluid from said compression chamber to said rebound chamber during the compression movement of said piston member toward said lower end of said cylinder member and from said rebound chamber to said compression chamber during the rebound movement of said piston member toward said seal assembly,

compression valve means in said base member providing for controlled flow of hydraulic fluid from said compression chamber to said reservoir chamber during said compression movement, and

replenishing valve means in said base member for enabling hydraulic fluid to flow from said reservoir chamber to said compression chamber during a rebound movement of said piston assembly toward said seal assembly,

the improvement which comprises said compression valve means comprising

a one-piece thin wall member including a generally cylindrical body portion having an annular flange portion extending generally radially outwardly from the upper end thereof and a cup-shaped portion of reduced diameter on the lower end thereof, said annular flange portion having at least one upward deformation formed therein defining a generally radially extending flow passage beneath said flange portion between the periphery thereof and said cylindrical portion,

said base member having an opening of a size greater than the size of said cylindrical portion extending therethrough, an annular flange receiving surface surrounding the upper end of said opening and an annular valve seat surrounding the lower end of said opening,

said thin wall member being mounted with respect to said base member with the annular flange portion thereof engaging the annular flange receiving surface of said base member, said cylindrical portion extending through said opening and said end portion spaced below said annular valve seat,

a spring retaining washer having a central opening receiving the cup-shaped end portion of said thin wall member therethrough, said cup-shaped end portion being deformed in rivet fashion to rigidly secure said washer to said thin wall member,

an apertured valve member slidably mounted on the cylindrical portion of said thin wall member for movement toward and away from said valve seat, and

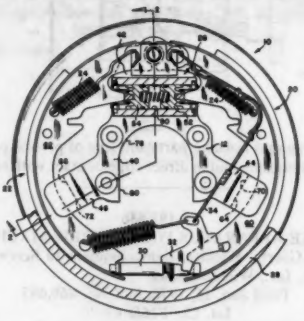
a coil spring surrounding the cylindrical portion of said thin wall member between said spring retaining washer and said valve member for resiliently urging the latter into engagement with said annular valve seat.

4,182,439

TORQUE MEMBER FOR A DRUM BRAKE

Michael A. Kluger, South Bend, and James J. Colpaert, Granger, both of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 22, 1978, Ser. No. 879,846
Int. Cl.[2] F16D *65/09*
U.S. Cl. 188—335 **1 Claim**



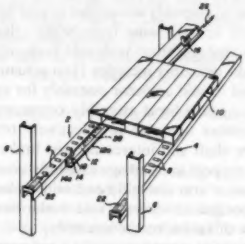
1. In a drum brake assembly having a torque member and a pair of brake shoes movable to a braking position by a hydraulic actuator, the torque member having a central section and a plurality of arm portions extending radially from the central section, one of the plurality of arm portions supportiing the hydraulic actuator and the remaining arm portions cooperating with the pair of brake shoes to direct the movement of the pair of brake shoes to the braking position, the improvement wherein each remaining arm portion defines a slot, and a substantially U-shaped spring clip is disposed within each slot, each of said U-shaped spring clips receiving a respective brake shoe to resiliently resist movement of each respective brake shoe in both axial directions and said slots form grooves receiving said spring clips to retain the latter within each of said slots.

4,182,440

PALLET FEEDING APPARATUS

Walter Juergens, Horbacher Strasse 313, 5100 Aachen-Horbach, Fed. Rep. of Germany

Filed May 10, 1978, Ser. No. 904,568
Claims priority, application Fed. Rep. of Germany, May 10, 1977, 7714753[U]; May 10, 1977, 2720916
Int. Cl.[2] B65G *13/00*
U.S. Cl. 193—35 A **10 Claims**



1. Pallet feeding apparatus for linearly feeding a succession of pallets toward a discharge station, comprising

(a) a frame;

(b) a pair of horizontal parallel track members connected with said frame, said track members being contained in a common horizontal plane;

(c) a plurality of rollers rotatably connected in longitudi-

nally spaced relation with each of said track members, respectively, said rollers being arranged to support the pallets for successive transport along said track members;

(d) a feed rod extending parallel with and adjacent one of said track members, the length of said feed rod being greater than that of each pallet;

(e) pin and guide slot means connecting said feed rod for sliding longitudinal displacement relative to said one track member, said guide slot means including a generally horizontal central portion, and a pair of downwardly extending end portions;

(f) weighted first detent means pivotally connected with the end of said feed rod adjacent the discharge station for engagement by the leading end of a first pallet, said first detent means being gravity biased in one sense toward a normally operable position;

(g) weighted second detent means pivotally connected with the other end of said feed rod for engagement with the trailing end of a second pallet, said second detent means being gravity biased in the opposite sense toward a normally operable position; and

(h) spring means biasing said feed rod longitudinally in a direction away from said discharge station, said first and second detent means and said pin and guide slot means being so arranged that when the first detent means is engaged by the forward end of the first pallet, said feed rod is initially longitudinally displaced in the direction of said discharge station toward a first end position and is subsequently displaced downwardly to release said first detent means from the forward end of the first pallet, whereupon said feed rod is displaced by said spring means, in the opposite direction toward a second position in which said second detent means engages the trailing edge of a second pallet.

4,182,441

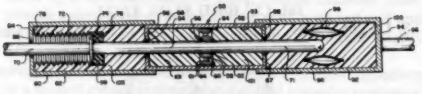
PIPE SNUBBER INCLUDING RESERVOIR AND SEAL STRUCTURE

Grant H. Strong, 1407 Sunset, Richland, Wash. 99352, and Donald J. Lagrou, Rte. 1, Box 372, Shelton, Wash. 98584

Filed Mar. 11, 1977, Ser. No. 777,240

Int. Cl.² F16F *9/20*

U.S. Cl. 188—312 **7 Claims**



1. A snubber comprising:

a snubber cylinder having a length, an inside diameter, a first end and a second end, the first end having a first closure with a first aperture, the second end having a second closure with a second aperture;

a shaft having a diameter less than the inside diameter of the cylinder and a length greater than the length of the cylinder, the shaft being mounted in the cylinder and extending a first end through the first aperture and a second end through the second aperture;

a load nozzle secured to the shaft and having a diameter which is less than the inside diameter of the cylinder, the load nozzle having a length substantially less than the length of the cylinder so as to accommodate reciprocating movement along the length of the cylinder, the load nozzle comprising a piston having a plurality of apertures therethrough;

a hydraulic fluid medium in the cylinder, the fluid adapted to resist movement of the load nozzle by resisting flow through the load nozzle apertures;

a first seal means in the first closure aperture and a second seal means in the second closure aperture, the first and second seal means resisting leakage of the fluid around the shaft while permitting reciprocating movement of the shaft with the cylinder;

a first reservoir enclosing the first seal means, the shaft passing through the first reservoir and a third seal means to seal the shaft against leakage from the first reservoir, the third seal means comprising a flexible bellows fixedly mounted at one end to the shaft inside the first reservoir;

a first compression means in the first reservoir;

a second reservoir enclosing the second seal means, the shaft terminating inside the second reservoir; and

a second compression means in the second reservoir.

4,182,442

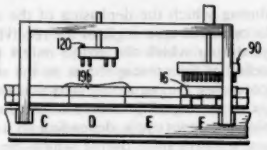
BRICK HANDLING AND FORMING VOIDS IN LAYERS OF BRICKS

Robert E. Jones, 15 S. Oak Forest Dr., Asheville, N.C. 28803

Continuation-in-part of Ser. No. 153,577, Jun. 16, 1971, Pat. No. 3,738,514. This application Dec. 1, 1972, Ser. No. 311,070

Int. Cl.² B65G *57/00*

U.S. Cl. 198—422 **48 Claims**



18. A method of forming at least one void in a multilayered group of bricks comprising the steps of: removing an upper layer of the bricks to expose the next lower layer of bricks for handling, removing a number of bricks from said lower layer, and restoring said upper layer on said lower layer, and wherein prior to restoring said upper layer on said lower layer a sheet-like member is placed over the lower layer.

45. Apparatus for automatically forming voids in the lower layer of a double layer course of articles, each article having a predetermined length and width, proceeding along an index conveyor, said apparatus including:

a frame having frame moving means associated therewith for moving said frame from a position removed from said double layer course to a gripping position overlying said double layer course;

a first set of gripper members depending from said frame and engageable with the articles in the upper layer of said course;

a second set of gripper members engageable with opposite ends of some selected articles only in the lower layer of said course;

said first and second sets of grippers being operable independently of each other.

4,182,443

HANDLING PROCESS FOR STAGING MANUFACTURED ARTICLES

Endre Pongracz, Ecublens, Switzerland, assignor to SAPAL, Societe Anonyme des Plieuses Automatiques, Ecublens, Switzerland

Filed Mar. 14, 1978, Ser. No. 886,592

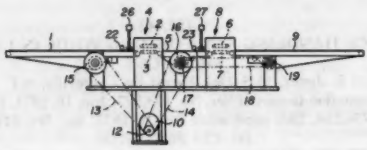
Claims priority, application Switzerland, Mar. 16, 1977, 3274/77

Int. Cl.² B65G *47/26*

U.S. Cl. 198—460 **11 Claims**

1. A handling process for staging manufactured articles leaving a production unit and traveling towards a receiving machine working at a preset speed; each article or group of articles leaving the production unit being oriented so as to match the requirements of the receiving machine, each article

following another on an endless conveyor belt, and being staged and phased at random in relation to the correct staging and phasing for the receiving machines operating cycle; the process comprising the steps of measuring the amount by which each article is out of phase with relation to a reference signal which defines the zero angle of the working cycle of the receiving machines, this reference signal immediately preceding detection of the said article in said measuring step; measuring the instantaneous speed of the receiving machine; speeding up or slowing down each article and at least one regulating station independence on the measured amount of dephasing and the speed of the receiving machine, wherein the speeding up or slowing down of each article comprises four stages: a



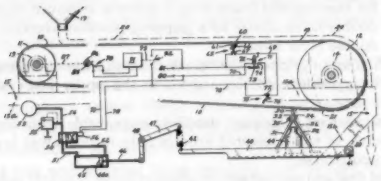
first stage during which the dephasing of the article is measured in relation to the zero angle of the receiving machine; a second stage during which the article enters the regulating station, traveling at the same speed as on the section of conveyor belt preceding the regulating station; a third stage during which the dephasing of the article is corrected by a speeding up and slowing down cycle, depending on its dephasing as measured; and a fourth stage during which the article leaves the regulating station and moves at the same speed as on the conveyor belt section following on the regulating station; and transferring the article on leaving the regulating station to an endless conveyor belt traveling in synchronization with the receiving machine.

4,182,444

HEATED CONVEYOR BELT SCRAPER

Eugene W. Fisher, Dickinson, N. Dak., assignor to General Steel & Supply Co., Dickinson, N. Dak.

Filed Jun. 23, 1978, Ser. No. 918,610
Int. Cl.[2] B65G *45/00*
U.S. Cl. 198—499 **13 Claims**



1. A scraper for a conveyor belt having a support frame, comprising:

a scraper blade;

a scraper blade support and means connecting said scraper blade thereto;

means for movably connecting said support to the frame of the conveyor for movement thereof between a first position in which the scraper blade is in contact with the conveyor belt and a second position in which the blade is moved away from the conveyor belt;

means for applying heat to said scraper blade;

means for sensing the position of a splice of the moving conveyor belt in relation to the position of the scraper;

actuator means operatively connected to said scraper blade support for movement thereof between said first and second positions; and

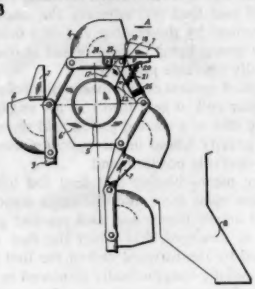
control means connected to said sensing means and said actuator means and operative to move said scraper blade away from said conveyor belt to allow passage of the splice, and further operative to move said scraper blade away from said conveyor belt in the event of stoppage thereof.

4,182,445

APPARATUS FOR TRANSPORTING BULK MATERIAL

Franz Batik, Perchtoldsdorf, Austria, assignor to Wiener Bruckenbau-und Eisenkonstruktions-Aktiengesellschaft, Austria

Filed Jun. 26, 1978, Ser. No. 919,353
Claims priority, application Austria, Jul. 19, 1977, 5195/77
Int. Cl.[2] B65G *17/36*
U.S. Cl. 198—703 **8 Claims**



1. An apparatus for transporting bulk materials, comprising an endless series of buckets fixed to spaced links of a chain device adapted for circulatory movement and guided over an upper return pulley, the buckets being adapted to be emptied as they pass over the upper return pulley, characterised in that discharge chutes are pivotally articulated to the upper return pulley at intervals corresponding to the spacing of the buckets.

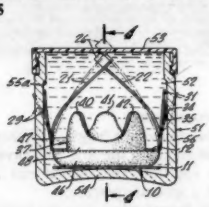
3. An apparatus according to claim 1, characterised in that the pivotal axis of each discharge chute is disposed in the region of its rear bottom edge.

4,182,446

HEART VALVE HOLDER

William Penny, Arcadia, Calif., assignor to Hancock Laboratories, Inc., Anaheim, Calif.

Filed Jun. 12, 1978, Ser. No. 914,534
Int. Cl.[2] B65D *85/50, 81/22*
U.S. Cl. 206—205 **22 Claims**



1. A device for holding a natural tissue heart valve assembly comprising

a base member adapted to support the base of a natural tissue heart valve assembly,

an annular member adapted to circumscribe such a heart valve assembly above the sewing ring thereof,

means for releasably securing said annular member in a spaced relationship above said base member,

and arm means projecting upwardly from said annular member,

said arms means including portions remote from said annular member adapted to engage one surface of a container receiving said heart valve holder when said base member engages an opposite surface of such container.

4,182,447

DEVICE FOR STORING, TRANSPORTING AND MIXING REACTIVE INGREDIENTS

Ira Kay, P.O. Box 201, Haymarket, Va. 22069

Filed Jul. 27, 1977, Ser. No. 819,236
Int. Cl.[2] B65D *25/08*
U.S. Cl. 206—220 **14 Claims**

1. In device for storing, transporting and mixing premeasured amounts of two mutually reactive ingredients which includes

a sealed capsular container formed from two opposed, abutting substantially rigid, hollow chambers closed at opposite ends and opened at the joined abutting ends,

a thin, rupturable membrane fixedly mounted over the open end of one of said hollow chambers and dividing the container into separated closed compartments, defined by the membrane and the hollow portion of each chamber, respectively,

a premeasured amount of a first reactive ingredient housed in one of said closed compartments,

a premeasured amount of a second reactive ingredient housed in the other of said closed compartments, and

a freely movable rupturing means housed in one or the other of said closed compartments and capable of rupturing said membrane when the device is subject to vigorous shaking,

wherein the container can be opened by separating the respective chambers along the longitudinal axis of the container but the respective chambers cannot be telescoped one over the other to thereby exert pressure on said membrane; the improvement comprising using polyvinylidene chloride as said rupturable membrane, whereby upon subjecting said device to vigorous shaking the membrane will rupture to permit intimate mixing and reaction of said first and second reactive ingredients without any portion of said ruptured membrane from interfering with or contaminating the reacted ingredients.

12. In a method for mixing premeasured amounts of mutually reactive ingredients which must be separated until just prior to use wherein the ingredients are stored in separate closed compartments on either side of a separating partition or membrane in an assembled, closed, capsular container, wherein displacement or rupturing of the separating partition or membrane is required to permit mixing of the previously separated ingredients, said mixing being effected by the steps of:

storing a first reactive ingredient in a first closed compartment of a capsular container, said first compartment defined by a first substantially rigid, hollow chamber comprising a generally cylindrical side wall, a closed end and an open end and a thin, taut rupturable membrane fixedly mounted over said open end;

storing a second ingredient reactive with the first ingredient in a second closed compartment in said capsular container, said second closed compartment defined by a second substantially rigid, hollow chamber comprising a generally cylindrical side wall, a closed end and an open end; said first and second hollow chambers being removably connected in abutting open end to open end fixed longitudinal relationship to form said assembled capsular container;

providing rupturing means freely movable within one of said first or second closed compartments to rupture said membrane when the closed capsular container is subjected to vigourous shaking, and

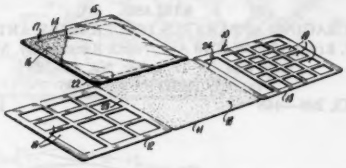
subjecting the closed capsular container to vigorous shaking to rupture the rupturable membrane and intermix the reactive ingredients; whereby the rupturing of the partition and mixing of the reactive substances is accomplished solely by said rupturing means as a result of vigorous shaking without requiring any manual or mechanical manipulation of the closed capsular container or the respective components thereof; the improvement comprising using polyvinylidene chloride as said rupturable membrane, whereby upon subjecting said device to vigorous shaking the membrane will rupture to permit intimate mixing and reaction of said first and second reactive ingredients without any portion of said ruptured membrane from interfering, with or contaminating the reacted ingredients.

4,182,448

RECEIVER FOR DISPOSABLE SURGICAL SHARPS

Charles M. Huck, Oldwick; Charles R. Ashley, Clinton; Ina L. Williams, Somerville, and Harvey B. Mandel, North Brunswick, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jul. 28, 1978, Ser. No. 929,065
Int. Cl.[2] A61C *17/02;* **B65D** *73/00, 85/24*
U.S. Cl. 206—380 **11 Claims**



1. A receiver for disposing of surgical sharps comprising a backing panel, a cover panel attached along one edge of said backing panel, a first matrix panel attached along a second edge of said backing panel and a second matrix panel attached along a third edge of said backing panel, said cover and matrix panels having dimensions substantially corresponding to those of said backing panel and being adapted to fold along said edge of attachment to overlay said backing panel,

said backing panel and said cover panel having a coating of a pressure-sensitive adhesive on one surface thereof,

said matrix panels having a plurality of surgical sharp receiving windows therein and being readily detachable from said backing panel,

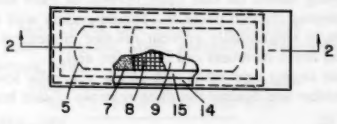
wherein one matrix panel may be detached from said backing panel and discarded while the other matrix panel is folded over the adhesive coated surface of said backing panel and adhesively secured thereto to provide a plurality of surgical sharp receiving windows having an adhesive coated base surface.

4,182,449

ADHESIVE BANDAGE AND PACKAGE

William J. Kozlow, 200 Starcrest Dr., Apt. 60, Clearwater, Fla. 33515

Filed Apr. 18, 1978, Ser. No. 897,361
Int. Cl.[2] B65D *85/00;* **A61L** *15/00*
U.S. Cl. 206—441 **6 Claims**



1. An adhesive handage and package therefor comprising in combination:

an adhesive backing strip with a pressure-sensitive adhesive coating on one surface;

an absorbent pad centrally positioned on the adhesivecoated surface of said backing strip so that opposite ends of said adhesive-coated strip are substantially extended beyond opposite edges of said pad;

a single internal cover sheet having at least the same width as said adhesive backing strip, one of the ends of said internal cover sheet being sealed to one adhesive-coated end of said backing strip, the other free end of said internal cover sheet disposed to extend over in contact relation

with said absorbent pad, completely covering and protecting said pad without being bonded thereto;

external covering means shaped similarly to said backing strip but dimensioned to extend beyond the edges thereof to provide narrow margins on the lateral edges and wider margins at opposite ends thereof, said external covering means being bonded at the edges to form a sterile sealed package for said adhesive bandage, including said backing strip, said absorbent pad and said internal cover sheet, whereby upon the opening of said package said internal cover sheet serves prior to removal as means for applying said adhesive bandage to a preselected surface.

4,182,450

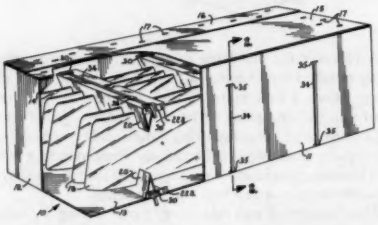
PACKAGING APPARATUS FOR FRAGILE ARTICLES

W. M. Kryger, 300 W. 23rd Ave., North Kansas City, Mo. 64116

Filed Jun. 26, 1978, Ser. No. 919,383

Int. Cl.[2] B65D *85/48, 81/06*

U.S. Cl. 206—448 **14 Claims**



1. Apparatus for packaging a fragile article, said apparatus comprising:

a rectangular, paperboard box container having a size sufficient to receive the article and presenting a plurality of interconnected walls;

a plurality of paperboard brace members arranged in spaced apart pairs and extending substantially between opposite walls of said container, each end of each said brace member having a planar end panel located inwardly of and substantially parallel to an adjacent corresponding wall of said container;

means on each brace member for receiving and holding a peripheral portion of the article;

a plurality of brackets disposed interiorly of said container, each said bracket having a plate portion, said plate portions being interposed between the respective end panels of said brace members and the interior surfaces of the adjacent corresponding walls of said container;

gripping means on said plate portion of each bracket for gripping the end panel and corresponding wall in a manner to substantially prevent relative movement between said brace members and container; and

means urging said walls and panels generally toward one another and against the plate portions of said brackets.

4,182,451

CONTAINER LEVEL HEIGHT DETECTOR

Harold K. Watson, San Francisco, Calif., assignor to Specialty Brands, Inc., San Francisco, Calif.

Filed May 30, 1978, Ser. No. 910,770

Int. Cl.[2] B07C *5/342*

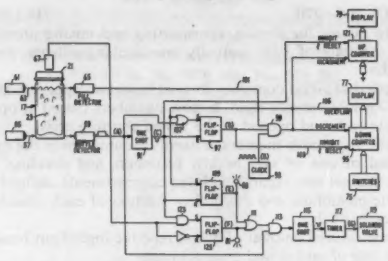
U.S. Cl. 209—524 **15 Claims**

1. A method of measuring the level of particulate material in a container, comprising the steps of:

scanning a beam of radiation across to the container at a desired fill level, said radiation being of a type that is heavily attenuated by said particulate material but which is able to penetrate the container,

detecting the intensity of the radiation beam after passing through the container,

determining the proportion of the radiation beam scan across the container wherein the radiation beam is attenuated or unattenuated by material therein, and



comparing said proportion with a predetermined threshold proportion, whereby it is determined whether the amount of particulate material in the container falls within acceptable limits.

4,182,452

METHOD FOR SORTING COPS, AND SPINTUBES USED THEREIN

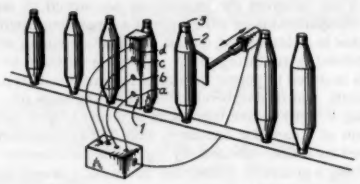
Rudolf A. Hulscher, Hengelo, Netherlands, assignor to Three Parks Limited, St. Helier, Channel Islands

Filed Apr. 7, 1977, Ser. No. 785,756

Claims priority, application Netherlands, Apr. 8, 1976, 7603705

Int. Cl.[2] B07C *5/344*

U.S. Cl. 209—569 **13 Claims**



1. A method for sorting cops comprising the steps of: guiding cops with premarked spintubes past a detection system, said cops comprising spintubes including their markings being covered with yarn; registering by physical means the presence or absence of yarn covered detection rings on the premarked spintubes and transmitting signals indicative of the presence or absence of said detection rings; and ejecting cops not satisfying a required pattern of marks.

4,182,453

RACK FOR DISPLAYING AND SECURING GUNS

Alan Worswick, 18 Mavis Rd., Blackburn, Lancashire, England

Filed Apr. 3, 1978, Ser. No. 893,019

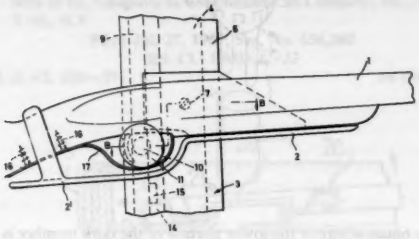
Claims priority, application United Kingdom, Apr. 1, 1977, 13964/77

Int. Cl.[2] E05B *73/00;* **A47F** *7/00*

U.S. Cl. 211—4 **5 Claims**

1. A rack for displaying and securing guns, which rack comprises a base having holes for receiving fastenings for securing the base to a wall, at least one gun support attached to the base for receiving and supporting a portion of a gun located adjacent the trigger guard, the at least one gun support extending underneath the gun so as to prevent access to screws which secure the trigger guard to the gun, the holes in the base being inaccessible when a gun is in place on said at least one gun

support, at least one recess in said base a locking pin which can be inserted through the trigger guard of the gun into said recess in the base, a longitudinally slidable locking bar for



locking the pin in said recess, the pin having a head shaped so that the gun cannot be withdrawn over the head of the pin once the pin is locked in said recess.

4,182,454

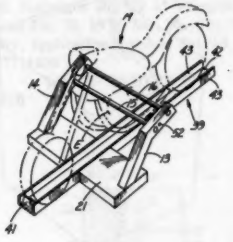
SECURITY STAND FOR MOTORCYCLE

Gary R. Tohms, 3501 W. 118th St., Cleveland, Ohio 44111

Filed Mar. 20, 1978, Ser. No. 890,602

Int. Cl.[2] E05B *73/00*

U.S. Cl. 211—5 **8 Claims**



1. A security stand for a motorcycle having a frame in which an engine is mounted, said stand comprising,

(a) a base,

(b) a pair of arms extending upwardly from said base in laterally spaced apart relationship with each other to accommodate said motorcycle between said arms in an upright position, each of said arms having corresponding oppositely disposed passage means through said arms to slidingly accommodate a locking pipe

(c) at least one elongated locking pipe for insertion through an opening between said engine and a frame member of said mtorocycle to prevent removal of said engine from said frame, in which locking pipe a cementitious material is contained, which cementitious material includes physically and chemically bound moisture and decrepitates when subjected to intense local heat, said elongated locking pipe being of sufficient length to bridge the space between said arms and to be inserted in said passage means, and

(d) key actuated locking means within at least one of said arms to releasably engage said locking pipe near its end.

4,182,455

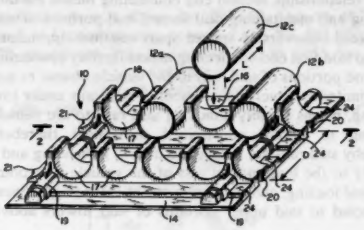
CONTAINER RACK

Adam Zurawin, New York, N.Y., assignor to Adams Brush Mfg. Co., Inc., Brooklyn, N.Y.

Filed Nov. 16, 1977, Ser. No. 851,869

Int. Cl.[2] A47F *5/08*; A47G *29/00*

U.S. Cl. 211—71 **3 Claims**



1. A container rack for removably mounting a plurality of axially parallel side-by-side cylindrical containers of a particular diameter, said rack comprising

a thermoplastic sheet defining a base plane, said sheet including a plurality of projections extending outwardly from said base plane entirely in one direction, said projections having opposed surfaces defining corresponding arcuate regions between adjacent ones of said projections, each of said corresponding arcuate regions having a diameter corresponding to the particular diameter of a container to be mounted on said rack between the opposed surfaces of said adjacent projections, the angular extent of said arcuate regions being an amount greater than 180° sufficient to enable said adjacent projections to elastically deform in response to movement of the selected container therebetween and to enable said adjacent projections to resiliently clamp the selected container in a stationary mounted position between said adjacent projections when the container is vertically oriented on said rack; and

an insertable and removable resilient insert strip dimensioned to conform with the opposed surfaces of a given pair of said adjacent projections, the annular extent of said strip being an amount greater than 180°, and said strip being sufficiently thick to enable a container having a particular diameter less than the diameter of the corresponding arcuate region between the given pair of projections to be mounted between said projections when said strip is disposed to overlap said opposed surfaces.

4,182,456

MATERIAL HANDLING MACHINE

David S. Paul, Northville, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Jun. 29, 1977, Ser. No. 811,407

Int. Cl.[2] B66F *9/00*; E02F *3/00*

U.S. Cl. 414—685 **25 Claims**

1. A frame for supporting implements on a vehicle having a chassis including a transversely extending axle housing, said

frame comprising: a pair of rails, said rails having first and second end portions and extending on each side of the longitudinal axis of said vehicle, a pair of tower structures one each attached between said first and second end portions of each rail and having an upper portion extending above said rails, first end connecting means arranged to interconnect and maintain said first end portions of said rails in a fixed transversely spaced apart relationship, second end connecting means for interconnecting and maintaining said second end portions of said rails in a fixed transversely spaced apart relationship, means adjacent to said first end connecting means flexibly connecting said first end portions of said rails to the vehicle chassis to accomodate limited transverse movement of said rails under torsional loading, means flexibly attaching said rails to the vehicle axle housing to permit constrained movement therebetween, whereby said rails are enabled to deflect in bending and transversely to the longitudinal axis of the vehicle to accomodate torsional loading, and stabilizing means extending between and connected to said upper portions of said towers above said rails.

4,182,457
MULTILAYER CONTAINER

Muneki Yamada, Ebina; Sadao Hirata, Yokohama; Jinichi Yazaki, Tokyo; Yoshitsugu Maruhashi, Yokohama; Kozaburo Sakano, Tokyo; Akira Kishimoto; Shunsaku Hirata, both of Yokohama; Toru Suzuki, Yokosuka, and Fumio Kano, Kamakura, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Aug. 3, 1977, Ser. No. 821,484
Claims priority, application Japan, Aug. 10, 1976, 51-94533; Jul. 18, 1977, 52-85114
Int. Cl.[2] B32B *15/08, 27/08*
U.S. Cl. 215—1 C **9 Claims**

1. A transparent multi-layer varied thickness container obtained by draw-forming a parison composed of a coextrudate of at least one oxygen barrier thermoplastic resin layer and at least one crystalline polyolefin layer, said oxygen barrier thermoplastic resin having an oxygen permeability lower than 5.5×10^{-12} cc·cm/cm^2·sec·cmHg as measured at 37° C. and being selected from the group consisting of a copolymer consisting essentially of ethylene and vinyl alcohol and a polyamide, wherein said oxygen barrier thermoplastic resin and said polyolefin are selected so that the requirement represented by the following formula:

$$|T_B - T_O| \geqq 35° \text{ C.}$$

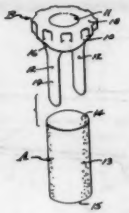
wherein T_B stands for the melting or softening point (°C.) of said oxygen-barrier thermoplastic resin and T_O stands for the melting or softening point (°C.) of said polyolefin, is satisfied, and wherein at least one of two-dimensional orientation coefficients (l and m) of at least one layer composed of said polyolefin in a smallest-thickness portion of the container is at least 0.05.

4,182,458
WINE BOTTLE STOPPER

Milton Meckler, 16348 Tupper St., Sepulveda, Calif. 91343

Filed Mar. 13, 1978, Ser. No. 885,866
Int. Cl.[2] B65D *51/16*
U.S. Cl. 215—307 **17 Claims**

1. A replaceable stopper for wine bottles and the like having a smooth cylindrical neck bore, and including in combination; a compressible cork member of elongated straight sided right cylinder form greater in diameter than the inner wall of the bottle neck bore to be stopped, and a crown member of substantially rigid material and comprised of an engageable head overlying the cork member and at least a pair of straight legs depending from the head to anchor the same to the cork member within the confines of the inner wall of the bottle neck, the said legs having smooth exterior surfaces slideably engaging the smooth cylindrical neck bore and terminating substantially short of the bottom of the cork member exposed to the interior

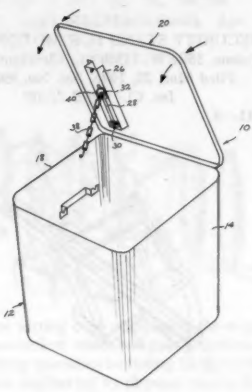


of the bottle whereby the lower portion of the cork member is a continuous circumferential seal.

4,182,459
SAFETY RECEPTACLE

Clarence E. Williams, 2122 W. 450 N., La Porte, Ind. 46350

Filed Mar. 29, 1979, Ser. No. 25,036
Int. Cl.[2] B65D *25/00*
U.S. Cl. 220—88 R **3 Claims**

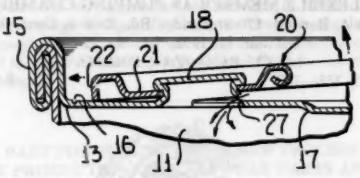


1. In a safety receptacle having a housing part and a lid part, said housing part including a bottom wall and a side wall extending upwardly from the bottom wall and terminating in an upper marginal edge defining an opening into the housing part, a hinge connection connecting said lid part to said housing part adjacent its side wall upper marginal edge, said lid part being shiftable about said hinge connection between a closed position spanning said opening and an open over-center position, said lid part being shiftable into its closed position by the weight of the lid part after being moved through its open over-center position, the improvement comprising a flexible retainer member having one end connected to one of said housing and lid parts spaced from said hinge connection, shiftable anchor means including a heat sensitive actuator and connecting the other end of said retainer member to the other of said housing and lid parts spaced from said hinge connection, said anchor means upon actuation of said heat sensitive actuator for pulling on said flexible retainer and thereby urging said lid part through its open over-center position to cause the lid part to shift into its closed position.

4,182,460
LEVER ACTION TAB SYSTEM FOR EASY OPENING ENDS

Albert J. Holk, Jr., Frankfort, and Arnold R. Boik, Chicago, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Jul. 27, 1967, Ser. No. 656,388
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—271 54 Claims

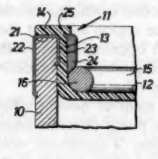


1. In an assembly including a panel having a removable portion, and a pull tab secured to said panel and restricted substantially against hinging relative to an adjacent portion of said panel; the improvement residing in a line of weakening formed in said panel removable portion immediately adjacent the connection between said pull tab and said panel for effecting the initial rupture of said panel upon the application of a panel rupturing force to said pull tab and the formation of hinge means in said panel with said hinge means including said connection and facilitating the hinging of said pull tab for effecting the further and separate rupture of said panel remote from said connection and the removal of said panel portion.

4,182,461
CLOSURE ARRANGEMENT FOR CONTAINER

Karl O. Waldau, Hagvägen 20, 722 33 Västerås, Sweden

Filed Jul. 18, 1978, Ser. No. 925,759
Claims priority, application Sweden, Jul. 19, 1977, 7708333; Oct. 11, 1977, 7711438
Int. Cl.[2] B65D *45/32*
U.S. Cl. 220—320 7 Claims

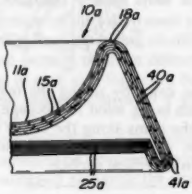


1. An arrangement for closing an open end of a substantially stiff, circumferentially closed side wall of a container, such as a generally cylindrical drum, said arrangement comprising a cover of an elastic, resilient material which is adapted to be fixed to an end portion of the side wall and which includes a central main portion adapted to form an end wall of the container and a peripheral flange formed integrally with the main portion and projecting in a generally axially outward direction from the main portion of the cover, said flange being insertable a limited length into said portion of the side wall together with the main portion of the cover in order to be brought with its outer side into sealing contact with the inner side of the end portion of the side wall, further comprising a hard circumferential spring ring that is closed about its entire circumference and which is adapted to be pressed into the cover, on the inner side of said flange, into engagement with a selected circumferentially extending section of the flange to force the outer side of said flange section into contact under pressure with the inner side of said end portion of the side wall.

4,182,462
SANITARY CONTAINER

George J. Buff, Jr., Kresson Rd. and N.J. Turnpike, Cherry Hill, N.J. 08034

Continuation-in-part of Ser. No. 393,445, Aug. 31, 1973, abandoned, and a continuation-in-part of Ser. No. 581,824, May 29, 1975, abandoned. This application Jan. 30, 1976, Ser. No. 654,024
Int. Cl.[2] B65D *23/02*
U.S. Cl. 220—450 7 Claims



1. A sanitary pet-feeding container and the like for resting on a supporting surface and repeated re-use without cleaning, said container consisting essentially of a plurality of identical layers of thin sheet material in superposed congruent facing engagement with each other, each of said layers except the outermost layer having its surface exposed in use completely covered by the next adjacent outer layer and exposed for use by removal of the next adjacent outer layers, and said layers each including a recessed central layer portion combining with superposed recessed central portions to define a receptacle with the outermost recessed central layer portion providing the food supporting surface of the receptacle, an upper layer portion extending entirely about the upper peripheral region of each of said recessed central layer portions and transversely arcuately curved with the outermost layer presenting an upwardly and outwardly convex surface, an outer circumferential layer portion depending from each of said upper layer portions entirely about each of said layers with the outermost layer presenting an outwardly facing circumferential surface, said circumferential layer portions all depending to a level below the recessed central layer portion of the innermost layer, and an inturned circumferential lip extending entirely about each circumferential layer portion from the lower region thereof and transversely arcuately curved with the outermost layer presenting a downwardly convex surface for engagement with a support with its marginal edge extending upwardly and inwardly; all except the outermost layer being spaced from the support surface when the outermost layer has its inturned circumferential lip engaging the support surface, said food supporting, upwardly convex, circumferential and downwardly convex surfaces of each layer except the outermost being subject to contamination in use and protected from contamination prior to use by the next adjacent outer layer.

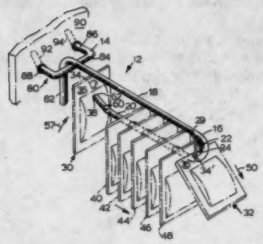
4,182,463
REAR LOADING HOOK

Harold D. Austin, 1152 NW. 106 St., Miami, Fla. 33150

Filed Jul. 21, 1978, Ser. No. 926,804
Int. Cl.[2] B65H *3/58*
U.S. Cl. 221—26 5 Claims

1. For supporting package items having a through hole adjacent one edge, a rear loadable hook having an inner end adapted to be supported by a vertical surface, and an outer end, and said hook including an upper run extending between the ends, and a lower run connected to the upper end at the outer end and extending generally horizontally from the outer end

toward but not to a terminal end adjacent the inner end, and the zone of juncture between the runs at the outer end defining a bite, said hook including a blade having a cutting edge facing said inner end and extending between the upper and lower runs

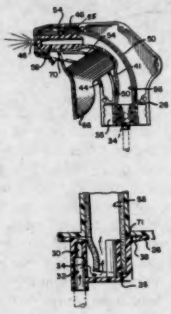


for removal of the items by slicing the margin adjacent the hole, said lower run being sized for passage through the hole for movement of the items along the lower run progressively toward said blade, and said inner end including means to mount said hook to a vertical surface.

4,182,464
TUBE SQUEEZER
Robert D. Orrey, 5575 East View Ct., Castro Valley, Calif. 94546
Filed May 26, 1978, Ser. No. 910,142
Int. Cl.[2] B65D *35/28*
U.S. Cl. 222—98 **5 Claims**

1. A dispensing device for manually emptying the paste contents from collapsible tubes, comprising in combination:
- a rigid U-shaped bracket formed with two right-angle bends such that the side surfaces of the bracket will be perpendicular to the axis of rollers that are to be mounted therein; the side surfaces having, in identical positions, a rod hole and an axle slot;
- a first roller having a rigid axle extending through both of said bracket axle slots and covered in the section that lies within said bracket side sufaces by elastic tubing and having threaded holes through said axle in both ends that extend outside of said bracket;
- a hard tubular second roller extending between the bracket side surfaces; the second roller having an axial slot for receiving the lower portion of a collapsible paste-containing tube just above a crimp-seal of the tube;
- two bearings of disc shape secured onto the facing sides of said bracket side surfaces and centered over said rod holes of said bracket and each bearing having a diameter slightly smaller than the inner diameter of said second roller whereby the second roller is mounted over the two bearings;
- a recess in one of said bearings and a recess in a congruent portion of said bracket of a size to allow sideways entry of the crimp-seal on the collapsible paste-containing tube into the center of said second roller;
- a rod extending through said rod holes of said bracket and parallel to said first roller and having holes through the ends that extend outside of said bracket;
- a screw on each side of said bracket passing through the holes in said rod and threading into said axle ends and of a length such that the heads of said screws bear against said rod when tightened to pull said axle closer to said second roller.

4,182,465
MANUALLY OPERATED PUMP USING HOLLOW FLEXIBLE MEMBER AS PUMPING CHAMBER
Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425
Filed Jun. 12, 1978, Ser. No. 914,397
Int. Cl.[2] B65D *37/00*; F04B *43/08*
U.S. Cl. 222—207 **8 Claims**



1. A pump adapted for connection to a container having liquid therein for discharging liquid therefrom, said pump comprising:
- a hollow housing having the general shape of a pistol with a vertical handle having a first opening in the bottom thereof and a barrel extending outward from the top of the handle with a free end having a second opening therein, the barrel having a lower surface with a third opening therein disposed between the free end of the barrel and the handle, the housing containing hollow curved guide means therein extending between a starting position in the handle adjacent the first opening and an ending position adjacent the second opening, the means being essentially horizontal in the region adjacent the ending position and having a fourth opening adjacent the third opening, the first opening being adapted to receive the upper open end of a vertical dip tube;
- a hollow tubular member having a flexible wall defining a variable volume pump chamber adapted to assume a fully distended position of maximum volume and a collapsed position of lesser volume, said member being disposed in the housing between said guides, the member having a vertical open end extending below the starting position adjacent the first opening and having a horizontal open end extending past the ending position;
- a manually operable trigger pivotally secured to the barrel, said trigger having a rest position at which it is disposed within the third opening and is spaced from the fourth opening and the member, whereby said member is fully distended, said trigger having an operative position at which it extends through the third and fourth opening to engage the flexible wall and collapse said member;
- a horizontally elongated poppet element having a front end with an off-center fifth opening and a rear end, said element having a horizontally elongated longitudinal groove extending from the fifth opening to a point intermediate the ends of the element but adjacent its rear end, the element being disposed in the horizontal end of the member with the fifth opening disposed adjacent but out of

alignment with the second opening, said second and fifth openings being interconnected by a channel, said member being sealed to the rear end of said element when the member is fully distended whereby passage of liquid from said member to said groove is blocked, said member being spaced from the rear end of the element when the member is collapsed whereby liquid in the member flows along said groove through the off-center fifth opening, channel and second opening to be discharged therefrom as a spray; and

valve means in the housing cooperating with the first opening and the vertical end of the member to block downward passage of liquid from the member into the handle through the first opening when the member is contracting and to allow said downward passage when the member is expanding.

4,182,466

WEAR PART FOR SLIDING GATES AND PROCESS FOR THE PRODUCTION OF SUCH WEAR PARTS AND SLIDING GATE WITH SUCH WEAR PARTS

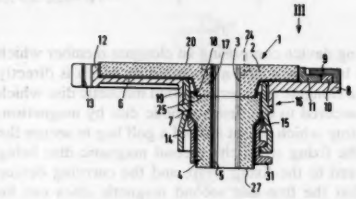
Hans R. Fehling, Geneva, Switzerland, and Horst Hase, Wiesbaden, Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 27, 1977, Ser. No. 810,285

Claims priority, application United Kingdom, Jun. 25, 1976, 26648/76

Int. Cl.² B22D *41/08*

U.S. Cl. 222—600 **14 Claims**



1. A wear part of a sliding gate defining an outlet of a vessel containing a metal melt,

said wear part comprising any one of parts of said sliding gate coming into contact with the metal melt, said parts including a sliding plate, a base plate, an inflow tube and an outflow tube,

said wear part being fabricated from a refractory material, sid refractory material being a fireproof refractory concrete, and

metal means surrounding said refractory concrete in a bonding engagement therebetween and for serving as a casting mold for receiving said refractory concrete in a poured condition, said metal means being a metal mantle,

whereby the poured refractory concrete hardens within said metal mantle to provide the bonded engagement therebetween, said refractory concrete and said metal mantle being retained as an integral unit to define said wear part.

4,182,467

VEHICLE ATTACHED CARRIER

Joseph V. Graber, 3739 County Trunk M, Middleton, Wis. 53562

Continuation-in-part of Ser. No. 646,175, Jan. 2, 1976, Pat. No. 4,085,784. This application Aug. 2, 1977, Ser. No. 821,086

The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.

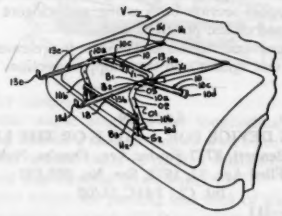
Int. Cl.² B60R *9/10*

U.S. Cl. 224—309 **5 Claims**

1. A vehicle attached carrier comprising:

(a) a pair of rigid generally U-shaped side frames disposed in relatively parallel planes, said side frames each being of one-piece stock and having an arcuate intermediate portion and two straight leg portions integral with the ends of the respective arcuate intermediate portion and diverging therefrom at an acute angle along lines generally tangent to the ends of the arcuate intermediate portion whereby the spacing between the leg portions of each side frame is substantially greater at the free ends thereof than adjacent the respective arcuate intermediate portion, means connected to the leg portions providing resilient vehicle engaging feet at the free ends thereof, the legs of each of said U-shaped side frames extending at relatively different angles to a plane through the vehicle engaging feet, said side frames each having a plurality of openings therethrough perpendicular to the plane of the respective side frame and at locations spaced apart along the arcuate intermediate portion of the side frames in non-linear relation and such that lines extending chordwise of the arcuate intermediate portion between different selected pairs of the openings in each side frame are disposed in at least several different planes relative to a plane through the vehicle engaging feet,

(b) a support frame including a pair of elongated arms, said arms being adapted to be disposed in a plurality of different positions extending alongside the arcuate intermediate



portion of a respective one of the side frames and generally chordwise thereof, said arms each having spaced openings therethrough and spaced apart a distance to register with different selected pairs of said plurality of openings in a respective side frame in different ones of said plurality of different positions to enable mounting of the arms on the arcuate intermediate portions of the side frames with the arms extending generally horizontally outwardly in cantilever fashion adjacent the part of the arcuate intermediate portion of the respective side frame that is uppermost when the vehicle engaging feet are disposed in different vertically inclined planes,

(c) bolts adapted to extend through two spaced openings in each of the arms and through a pair of registering openings in the arcuate intermediate portion of the respective side frame for attaching the arms to the arcuate intermediate portion of the side frames in selected ones of said plurality of different positions with the arms extending chordwise of the arcuate intermediate portion of the side frames at different angles to a plane through the vehicle engaging feet,

(d) at least one cross member connected to the side frames and extending therebetween, and

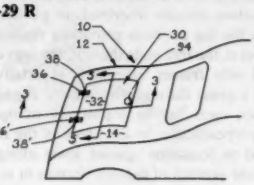
(e) strap means for attaching the carrier to a vehicle with the vehicle engaging feet resting on the vehicle body.

4,182,468

COMBINED CLOSURE AND RUMBLE SEAT FOR AUTOMOBILES

Griffith L. Hoerner, 2211 Montana Ave., Santa Monica, Calif. 90403

Filed Oct. 21, 1977, Ser. No. 844,367
Int. Cl.[2] B60R 7/00
U.S. Cl. 224—29 R **9 Claims**



1. In combination with a vehicle deck having an opening formed therein to provide access to a storage cavity interiorly thereof and having a closure rotatably mounted thereon for pivotal movement into a generally upright position to form a back support section of a rumble seat and into a closed position over said opening, the improvement which comprises:

a seat;

flexible strap means attached to said deck or to said closure and to said seat for suspending said seat within said cavity to act in combination with said closure to form said rumble seat and for permitting storage of said seat against said back support section both when said closure is in said upright and closed positions; and

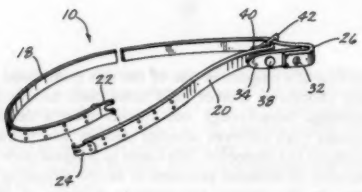
retention means carried on said closure for releaseably holding said seat against said back support section.

4,182,469

SLING DEVICE FOR A RIFLE OR THE LIKE

Herman W. Bennett, 8777 Fowler Ave., Omaha, Nebr. 68134

Filed Apr. 12, 1978, Ser. No. 895,537
Int. Cl.[2] F41C 33/00
U.S. Cl. 224—311 **2 Claims**



1. A sling device for a weapon having fore and butt ends, comprising,

a first elongated flexible strap having first and second ends,

a second elongated flexible strap having first and second ends,

said first ends of said first and second straps being adjustably secured together,

a ring means selectively slidably mounted on said first strap,

said second end of said second strap being secured to said ring means,

said first strap being selectively adjustably secured to the weapon adjacent the butt end thereof,

said first strap having a U-shaped portion which is secured to the weapon adjacent the fore-end thereof,

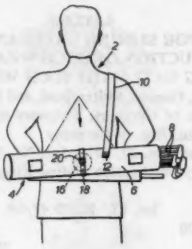
and fastener means selectively securing said second end of said second strap to said first strap adjacent said U-shaped portion, wherein said U-shaped portion is secured to said weapon by a screw means extending through said U-shaped portion and said fastener means comprising a first snap fastener element mounted on said second end of said second strap, a snap strap secured to said screw means and extending therefrom, and a second snap fastener element on said snap strap for connection to said first snap fastener element.

4,182,470

CARRYING DEVICE

Kenneth R. Atkinson, Wisteria Cottage, 288 Leigham Court Rd., Streatham, London, England

Filed Jan. 9, 1978, Ser. No. 867,885
Claims priority, application United Kingdom, Feb. 9, 1977, 5315/77
Int. Cl.[2] A45F 5/00
U.S. Cl. 224—183 **4 Claims**



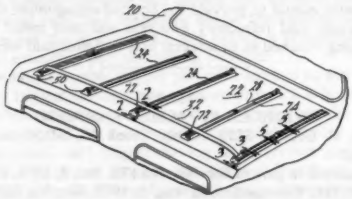
1. A carrying device comprising an elongate member which is adapted to be worn, a first magnetic disc which is directly adhered to the elongate member, a second magnetic disc which is releasably secured to the first magnetic disc by magnetism, and a fixing strap which passes around a golf bag to secure the golf bag to the fixing strap, the second magnetic disc being directly adhered to the fixing strap, and the carrying device being such that the first and second magnetic discs can be separated from each other by a sliding action to enable the golf bag to be removed from the elongate member so that it can be filled and emptied.

4,182,471

ARTICLE CARRIER FOR AUTOMOTIVE VEHICLES

John A. Bott, 931 Lake Shore Dr., Grosse Pointe Shores, Mich. 48236

Division of Ser. No. 743,602, Nov. 22, 1976, Pat. No. 4,099,658, which is a continuation of Ser. No. 486,415, Jul. 8, 1974, abandoned. This application Jul. 7, 1978, Ser. No. 924,072
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.[2] B60R 9/00
U.S. Cl. 224—326 **4 Claims**



1. In an automobile having a body with an exterior horizontal surface such as a trunk lid or a roof, an article carrier system for supporting and securing articles on said exterior surface and structurally reinforcing said surface comprising a pair of elongated slats on said surface in respective positions on opposite sides of the longitudinal axis of the body and extending

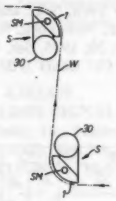
substantially parallel to the longitudinal axis of the body, means permanently securing said slats to said body in said positions, said slats being substantially rectangular in vertical cross section with a width substantially greater than the height of the section and presenting a low profile on said surface, the tops of said slats being substantially flat and parallel to said horizontal surface and providing means on which articles may be rested and supported above said surface, and an elongated removable article securing member extending transversely of said slats and having end portions slidable along the lengths of the respective slats and removably mounted on said slats, said end portions including screw operated manual clamping means for temporarily clamping the end portions to the slats in fixed longitudinal positions on the body, said slats comprising a permanently positioned low profile attachment means on said body for said carrier system and said article securing members comprising adjustable components of said system that are selectively removable from said slats and said body.

4,182,472

CONTACTLESS TURNING GUIDE FOR RUNNING WEBS

Andres Peekna, Green Bay, Wis., assignor to W. R. Grace & Co., New York, N.Y.

Filed Jul. 13, 1978, Ser. No. 924,160
Int. Cl.[2] B65H *27/00, 17/32*
U.S. Cl. 226—97 **7 Claims**



1. A contactless web support having an elongated arcuate surface and over which a running web is floatingly supported without contact therewith, a plurality of parallel grooves formed in said surface and extending around said arcuate surface and in a direction in which the web passes thereover, said grooves terminating in opposite ends, a pair of elongated nozzles extending along the length of said elongated arcuate surface, one nozzle located adjacent each of the ends of said grooves, said nozzles having discharge slots directed toward one another and over said arcuate surface, and means for supplying pressurized air to said nozzles to thereby form a fluid pressure zone between said arcuate surface and the web passing thereover, said parallel grooves forming labyrinth seals which inhibit transverse flow of air outwardly of the fluid pressure zone toward the edges of said running web.

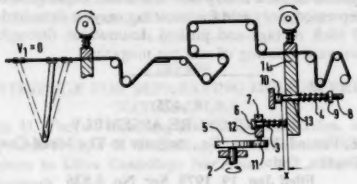
4,182,473

WEB TENSIONING APPARATUS

Budai Mikulas, Pelikanstrasse 5, CH-90004 St. Gallen, Switzerland

Filed Mar. 9, 1978, Ser. No. 884,809
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 2710914
Int. Cl.[2] B65H *17/26*
U.S. Cl. 226—143 **4 Claims**

1. An apparatus for tensioning a length of elastic web, comprising stationary and movable clamp means for clamping the opposite ends of said length, the movable clamp means having a first spring means for elastically forcing it in a direction towards said length and a second spring means for elastically forcing the movable means in a direction away from said



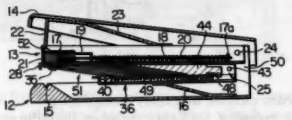
length, said second means providing greater spring force than said first means plus said length's resistance to stretching.

4,182,474

STAPLER HAVING STAPLE AND TAG MAGAZINES

Hisao Sato, 10, Toyotamaminami-3-chome, Nerima-ku, Tokyo, Japan

Filed Oct. 10, 1978, Ser. No. 949,444
Int. Cl.[2] B25C *5/02*
U.S. Cl. 227—99 **7 Claims**



1. A stapler comprising
an elongated staple magazine for longitudinally slidably receiving therein a stick of staples which are detachably connected to each other in parallel relationship in series with their legs directed downwards,
staple pusher means for pushing said stick of staples in said staple magazine towards the front end thereof,
stop means at the front end of said staple magazine for holding the foremost staple of said stick of staples in a predetermined position, a staple throat formed through said staple magazine adjacent to the front end thereof for passing downwards therethrough said foremost staple held in said predetermined position by said stop means,
an elongated tap magazine disposed beneath said staple magazine for longitudinally slidably receiving therein a stick of tags which are detachably connected to each other in a predetermined overlapping relationship in series,
said elongated tag magazine having a top wall, side walls and a bottom wall opened downwards at least at its front end portion,
said top wall of said tag magazine having an opening formed therethrough adjacent to the front end thereof in line with said staple throat of said staple magazine,
tag pusher means for pushing said stick of tags in said tag magazine towards the front end thereof,
stop means for holding the front or leading edge of the foremost tag of said stick of tags at a predetermined position in such a way that the front portion of said foremost tag which is not overlapped with the succeeding tag may be held immediately below said staple throat of said staple magazine,
a depression means including a staple driver means adapted to engage with the crown of the foremost staple so as to drive said foremost staple through said staple throat of said staple magazine into said foremost tag,
a staple clinching means disposed immediately below the downward opening of said tag magazine for cooperating

with said staple driver means to clinch the legs of said foremost staple,

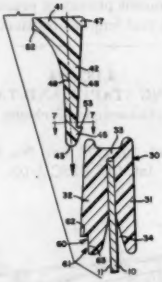
a retaining means for retaining said stick of tags in said tag magazine in such a way that when said depression means is depressed, only said foremost tag may be detached from said stick of tags and pushed downwards through said downward opening of said tag magazine.

4,182,475

DRUM CLOSURE ASSEMBLY

Donald F. Freund, Macon, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 19, 1979, Ser. No. 4,826
Int. Cl.[2] B65D *41/16, 5/02*
U.S. Cl. 229—5.7 **11 Claims**



1. A drum closure assembly comprising:

(A) a ring member, said ring member including:

(i) an outer ring portion;

(ii) an inner ring portion laterally displaced from said outer ring portion, said inner ring portion being angularly displaced from parallel to said outer ring portion;

(iii) a connecting portion fixedly joining said inner ring portion to said outer ring portion;

(iv) an elongated groove being defined by said inner ring portion, said outer ring portion and said connecting portion, said groove being receptive to the uppermost edge of a drum, and

(B) a cover member, said cover member being cooperatively sized for insertion into said ring member, said cover member including:

(i) a top cover member;

(ii) a continuous annular wall member projecting downwardly from said top cover member, the circumference of the bottommost edge of said annular wall member being smaller than the circumference of said top cover member, the outer surface of said annular wall member being angularly displaced from a line perpendicular to a plane defined by said top cover member.

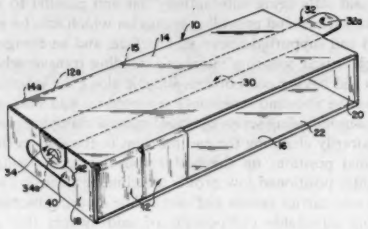
4,182,476

CONTAINER AND CABINET THEREFOR

Jack S. Lovewell, Philadelphia, Pa., assignor to Shell Container Systems, Union, N.J.

Filed Jul. 28, 1978, Ser. No. 929,180
Int. Cl.[2] B65D *5/72*
U.S. Cl. 229—17 B **6 Claims**

1. In a plastic container having a pair of sidewalls, top and bottom walls, an end wall, and a cover member for opening and closing an open end of said container, said cover member being pivotally connected to said bottom wall, said cover member including a pair of side flaps extending therefrom for interconnecting said cover member and said sidewalls, the improvement comprising: said side flaps each having a locking tab formed therein such that said locking tab is movable out of the plane of said side flap, each of said sidewalls including a locking slot formed therein, said locking slot including a central slot portion and end slot portions forming end locking elements at each end of said central slot portion, said end locking elements being movable out of the plane of each of said sidewalls, said locking tabs being engageable with and movable relative to said respective locking slots such that movement of



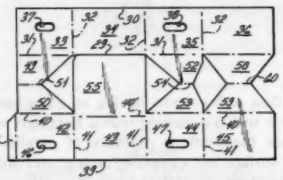
each of said locking tabs to engage one of said end locking elements on each of said sidewalls operates to bias each of said engaged locking tabs and end locking elements out of their respective planes to automatically lock said cover member in an open or closed position.

4,182,477

COLLAPSIBLE CARTON

Richard E. Paige, New York, N.Y., assignor to The Paige Company Containers, Inc., New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 965,356
Int. Cl.[2] B65D *5/02, 5/36*
U.S. Cl. 229—37 R **4 Claims**



1. A carton comprising inner and outer snugly nested tubular shells, each shell including a series of side wall panels hingedly connected together along their side edges, said shells being telescopically adjustable into and out of a set-up relationship in which the overlying side wall panels define a set of double-walled carton sides, a plurality of foldable strips interconnecting adjacent bottom edges of only some of said overlying side wall panels, said strips extending transverse to said side wall panels when said shells are telescoped into the set-up relationship so as to define a floor support, and a floor panel hinged to the bottom edge of a side wall panel havng no foldable strip connected to its, said floor panel overlying said floor support and defining a smooth floor of the carton.

4,182,478

DISPOSABLE EMESIS CONTAINER

Donald E. Etes, Crystal Lake, Ill., assignor to North American Laboratories, Inc., Crystal Lake, Ill.

Filed Dec. 21, 1978, Ser. No. 971,938
Int. Cl.[2] B65D *33/24*
U.S. Cl. 229—62 **2 Claims**

1. In a disposable emesis container consisting of a bag and a wide bottom funnel with the mouth of the bag fitting over and secured to the bottom of the funnel, said bag and funnel having a normally flattened collapsed empty condition, said funnel

being formed of a material having paperboard-like stiffness and flexibility with the convex upper edges thereof juxtaposed in the flattened condition of the funnel, said funnel having juxtaposed concave score lines formed in the opposite sides thereof in the flattened condition with the opposite ends thereof terminating at the opposite ends of said convex upper edges, and said convex upper edges and their associated concave score lines forming generally elliptical panels with pointed ends at the mouth of said funnel which upon being inwardly folded-

over one another provide a self-retaining closure for said container, the improvement which comprises: downwardly arcuate score lines in the opposite sides of said funnel adjacent said wide bottom thereof which are juxtaposed in registration in the flattened collapsed condition of the funnel and which upon being pressed together when said funnel is open but after said generally elliptical panels have been folded-over on each other, act to close together the bottom edges of said wide bottom.

4,182,479

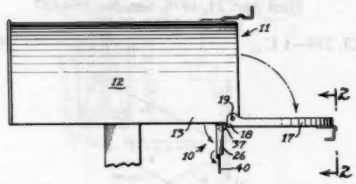
MAILBOX SIGNAL

Logan D. Swift, 518 Starlinder Dr., Nashville, Tenn. 37209

Filed Oct. 30, 1978, Ser. No. 955,596

Int. Cl.[2] B65D *91/00*

U.S. Cl. 232—35 **5 Claims**



1. In a mailbox having a bottom wall, a front opening and a door having a bottom portion below the level of said bottom wall, said bottom portion being journaled about a transverse axis for swinging movement between an upright position closing said front opening and an extended forward open position, a signal device comprising:

(a) a flag member journaled to said mailbox beneath said bottom wall about a horizontal main axis, eccentrically, to form an elongated signal portion on one side of said main axis and a heel portion on the opposite of said main axis, said signal portion having a greater moment about said main axis than said heel portion,

(b) a latch member journaled to said mailbox beneath said bottom wall about a horizontal transverse axis to form a hook on one side of said transverse axis and an abutment member on the other side of said transverse axis,

(c) said hook being adapted to engage said heel portion to hold said signal portion in an elevated inoperative position,

(d) said abutment member being spaced behind and in the swinging path of the bottom portion of said door,

(e) said abutment member being adapted to be engaged and moved by said bottom portion when said door swings to a predetermined forward open position, causing said hook to disengage said heel portion to permit said flag member to swing down about said main axis to expose said signal portion to view in operative position.

4,182,480

CENTRIFUGE FOR SEPARATING HELIUM FROM NATURAL GAS

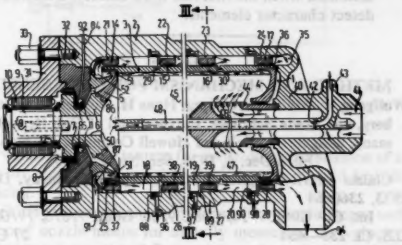
Frederik H. Theyse, Bensberg-Herkenrath, Fed. Rep. of Germany, and Fridtjof E. T. Kelling, Amsterdam, Netherlands, assignors to Ultra Centrifuge Nederland N.V., The Hague, Netherlands

Filed Jun. 2, 1977, Ser. No. 802,900

Claims priority, application Netherlands, Jun. 28, 1976, 7607039

Int. Cl.[2] B04B *5/08*

U.S. Cl. 233—27 **23 Claims**



1. Centrifuge for separating gaseous mixtures comprising at least one hollow, cylindrical separator drum which is rotatable about its axis in a housing the separating drum having at one end an end wall in which openings are provided close to the inside wall of the separating drum through which openings a second separation component passes into a space between the drum and the housing, a stationary admission tube for admitting to the drum the gaseous mixture to be separated, said admission tube being rigidly fastened to the housing, at least one outlet tube for discharging a first separation component from the drum, said tubes being open into a separating chamber situated inside the separating drum, a driving motor coupled to the drum, at least one outlet located in the housing for the discharge of the second separation component from the housing, and means forming the space between the drum and the housing into an expansion slot for conveying the second separation component from said openings to said outlet while undergoing a gradual reduction of pressure, said means including a plurality of throttling restrictors.

4,182,481

BAR CODE READING DEVICE

Daniel Maussion, Angers, France, assignor to Compagnie International pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Aug. 25, 1978, Ser. No. 936,693

Claims priority, application France, Aug. 30, 1977, 77 26343

Int. Cl.[2] G06K *7/08, 19/06*

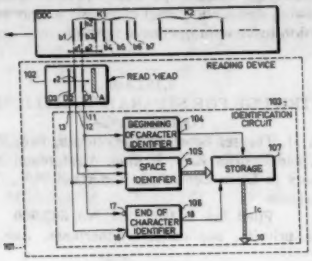
U.S. Cl. 235—449 **13 Claims**

1. A device for reading characters formed of elements separated by spaces of first and second kinds in accordance with a character code, said device comprising:

a read head arranged for motion relative to the elements of a character, said read head including three element detectors physically spaced such that the first and second detectors are separated by a distance equal to the first kind of space, and the first and third detectors are separated by a distance equal to the second kind of space; and

means responsive to said detectors for identifying the two kinds of space, the first kind of space being identified

when the first and second detectors simultaneously detect character elements, and the second kind of space being



identified when the first and third detctors simultaneously detect character elements.

4,182,482

METHOD AND MECHANISM FOR CODE SENSING

Wolfgang W. Müller, Friedberg; Hans H. Dobberstein, Rockenberg, and Erwin Schröder, Butzbach, all of Fed. Rep. of Germany, assignors to Bell and Howell Company, Chicago, Ill.

Filed Dec. 4, 1974, Ser. No. 529,383

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1973, 2360664

Int. Cl.[2] G06K *7/14;* **G08C** *9/06;* **G06K** *7/016, 19/06*

U.S. Cl. 235—454 **27 Claims**

4. Apparatus for reading code marks arranged on a record carrier comprising a plurality of mark sensing elements spaced from one another, an adjoining two of said elements being substantially closer together than the spacing between other adjoining ones of said elements, said adjoining two closer elements defining a line parallel to which said record carrier and said plurality of mark sensing elements move relative to one another, a control mark of said code marks passing immediately adjacent to said two closer elements, with the others of said elements having an arrangement corresponding to an arrangement of the others of said code marks, with complementary ones of said other code marks and said other elements being approximately adjacent one another when said control mark is between said adjoining two close elements, the mark-sensing elements comprising end portions of optical fibers.

4,182,483

FLUID ACTUATED DAMPER CONTROL APPARATUS

Paul F. Swenson, 25525 Edgecliff, Euclid, Ohio 44132

Continuation-in-part of Ser. No. 704,548, Aug. 12, 1976, Pat. No. 4,076,171. This application Feb. 27, 1978, Ser. No. 881,733

Int. Cl.[2] F23N *3/02*

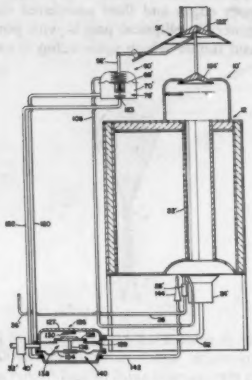
U.S. Cl. 236—1 G **6 Claims**

1. In a heating apparatus of the type including a fluid fuel burner, a vent for discharging the products of combustion produced by said burner, a supply line for supplying fluid fuel to said burner and a main valve means operable between open and closed positions for controlling the flow of fuel through said supply line to said burner, the improvement comprising:

at least one damper means movable between open and closed positions for controlling flow through said vent;

expansible chamber fluid motor means connected to said flow control damper means for moving said damper means to an open position when pressurizied and to a closed position when unpressurized;

connection means for pressurizing said expansible chamber motor means whenever said main valve means is in an open position;



a pressure-operated control valve in said supply line between said main control valve and said burner for preventing flow of fuel to said burner until pressurized; and,

means for pressurizing said pressure-operated control valve only when said motor means operates to open said damper means.

4,182,484

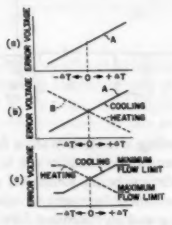
TEMPERATURE CONTROL FOR VARIABLE VOLUME AIR CONDITIONING SYSTEM

Dennis A. Stanke, La Crescent, Minn., and Paul C. Rentmeester, La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Apr. 24, 1978, Ser. No. 899,627

Int. Cl.[2] F25B *29/00*

U.S. Cl. 236—1 C **10 Claims**



1. A temperature control for a variable volume air conditioning system wherein electric motor-operated air valve means are provided for varying the volume of relatively warm or relatively cool conditioned air supplied to a conditioned zone, said temperature control comprising

a. zone thermostat means for sensing the temperature within a conditioned zone, determining the deviation between a set-point temperature and said zone temperature, and for producing an electrical error signal comprising a voltage having a magnitude which varies in a predetermined relationship with respect to said deviation in temperature;

b. duct temperature sensing means for sensing the temperature of conditioned air being supplied to said conditioned zone and for producing an electrical duct temperature signal related thereto;

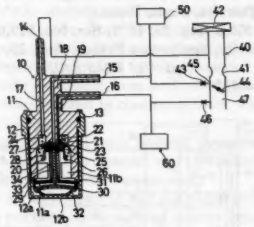
c. changeover circuit means for receiving said error and duct temperature signals and comprising
   i. an inverter for receiving said error signal and operative to vary said predetermined relationship between the magnitude of said error signal and said deviation in temperature, thereby producing a first mode error signal comprising a voltage signal having a magnitude inversely related to that of said error voltage signal; and
   ii. switch means responsive to said electrical duct temperature signal for transmitting said first mode error signal as an output error signal in response to a temperature of said conditioned air indicative of one of relatively warm or relatively cool conditioned air being supplied to said conditioned zone, and for transmitting a second mode error signal as an output error signal in response to a temperature of said conditioned air indicative of the other of said relatively warm or relatively cool conditioned air being supplied to said conditioned zone, said predetermined relationship between the magnitude of said error signal and said deviation in temperature being maintained in said second mode error signal; and
d. valve motor control circuit means for receiving said output error signal and for energizing electric motor-operated air valve means in response thereto so as to vary the volume of conditioned air being supplied to said conditioned zone in a sense to restore the zone temperature to the set-point temperature.

4,182,485

THERMALLY RESPONSIVE VALVE

Kazuhiko Kitamura, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jul. 20, 1978, Ser. No. 926,383
Claims priority, application Japan, Jul. 26, 1977, 52-99556[U]
Int. Cl.[2] G05D *23/10*
U.S. Cl. 236—48 R **4 Claims**



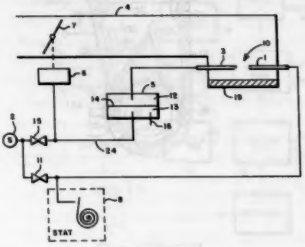
1. A thermally responsive valve device comprising a body member having inlet port means and first and second outlet ports therein, first and second passages provided in said body member, said first passage providing communication between said inlet port means and said first outlet port, said second passage communicating with said second outlet port, a first valve seat positioned in said first passage, a first valve member movable into and out of engagement with said first valve seat, a penetrating passage provided through said first valve member, said second passage communicating with said inlet port means through said penetrating passage when said first valve member engages with said first valve seat and directly with said inlet port means when said first valve member is released from said first valve seat, a second valve seat formed on said first valve member, a second valve member movable into and out of engagement with said second valve seat, a first dish-shaped bimetal disk movable with snap-action motion to a reverse disk shape in response to a change in temperature through a first predetermined temperature level thereby operating said first valve member to close and open said first passage, and a second dish-shaped bimetal disk movable with snap-action motion to a reverse disk shape in response to a change in temperature through a second predetermined temperature level thereby operating said second valve member to close and open said penetrating passage.

4,182,486

FLUIDIC FLOW SENSING AND CONTROL APPARATUS

Richard C. Mott, Harwood Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 590,995, Jun. 27, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,471
Int. Cl.[2] G01F *1/00*; F24F *11/04*
U.S. Cl. 236—49 **29 Claims**



1. A variable volume system for controlling the position of a damper to regulate a condition of air in a duct, said system comprising:
   air velocity sensor means comprising first nozzle means and second nozzle means for directly measuring the velocity of air moving past said first and second nozzle means, said first and second nozzle means adapted to be arranged for sensing said condition of said air in said duct by passing at least a portion of said air past said first and second nozzle means, said first nozzle means arranged to issue a jet of fluid and said second nozzle means arranged for receiving a portion of said fluid dependent upon said condition of said air;
   fluid supply terminal means;
   first connecting means connecting said terminal means to said first nozzle means;
   damper actuator means adapted to control the position of said damper; and,
   second connecting means connecting said second nozzle means to said damper actuator means for varying the position of said damper dependent upon said condition of said air and dependent upon the velocity of said jet of fluid.

4,182,487

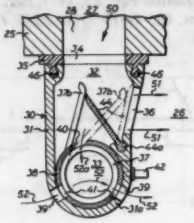
APPARATUS HAVING A TEMPERATURE SENSITIVE ELEMENT FOR CONTROLLING A DAMPER IN A VENTILATION SYSTEM

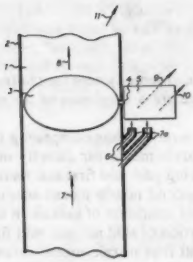
Lennart O. R. Eriksson, Kalmar, Sweden, assignor to Teknoterm Systems AB, Malmo, Sweden

Continuation-in-part of Ser. No. 687,612, May 18, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 861,706
Claims priority, application Sweden, May 26, 1975, 7505932
Int. Cl.[2] F24F *7/00, 13/08*
U.S. Cl. 236—49 **13 Claims**

1. In residential buildings, apartment houses and the like equipped with a venting duct controllable by means of a movable duct closing means, the venting duct having an inlet side and having an outlet side, an apparatus for controlling the flow of air through the venting duct to the outlet side thereof, the apparatus comprising the movable duct closing means in the venting duct, a motion transmitting device for operating the duct closing means in the duct thereby for resulting control of the cross-sectional area of the duct, and a temperature sensitive element cooperating with the motion transmitting device and adapted to react to temperature changes and to thereby actuate

in cooperation with the motion transmitting device the duct closing means in the venting duct in dependence on the actuation of the temperature sensitive element by the temperature, the temperature sensitive element being disposed at the outlet side of the venting duct so that it is exposed to the temperature and air flow conditions prevailing at the outlet side, and the venting duct having air flow shunting means for shunting part of the air flowing through the duct as a part flow into contact with the temperature sensitive element so that both said part





flow and air of the temperature prevailing at the outlet side of the duct are allowed to actuate the temperature sensitive element, whereby the temperature of the temperature sensitive element is influenced by the part flow in a degree dependent on both the prevailing outdoor temperature and wind force and by the prevailing indoor temperature, whereby the motion transmitting device is thereby actuated such that it tends to open or close the duct closing means in dependence on a combination of at least the outdoor temperature, the outdoor wind force and the indoor temperature.

4,182,488

PRESSURE REGULATOR

Hendrikus Berkhof, Emmen, Netherlands, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 30, 1977, Ser. No. 866,071
Int. Cl.[2] G05D *27/00*
U.S. Cl. 236—92 A **6 Claims**

1. A pressure regulator for a gas supply which has a pressure output varying over a range of temperature comprising:

a base member,

a chamber with said base member having an inlet and outlet connected to furnish gas having a predetermined pressure, said chamber having a diaphragm on one side, said diaphragm being connected to control a valve in said inlet, said valve being opened when gas pressure increases in said chamber,

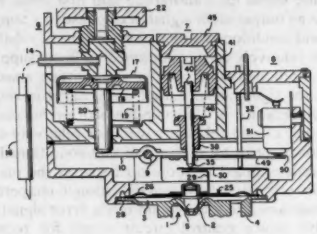
adjustable resilient member for applying a force,

spring means connecting said resilient member to said diaphragm on the opposite side of said chamber to apply a force to said diaphragm whereby the pressure of the gas at said outlet is selected by the position of said adjustable member, and

temperature responsive means connected to said adjustable resilient member for changing said force and thus modifying the gas pressure at said outlet as temperature changes,

said spring means comprises a first blade spring having one end attached to the base and the second end moveable freely, and a second spring having one end attached to the diaphragm and the other end engaging the free end of said first spring

said adjustable resilient member comprises a pin support by



said base and having one end engaging the upper surface of the free end of said first spring, and a coil spring surrounding said pin and having one end attached to an adjustable screw member in said base and the other end attached to said pin for biasing said pin downward against the free end of said first spring, and

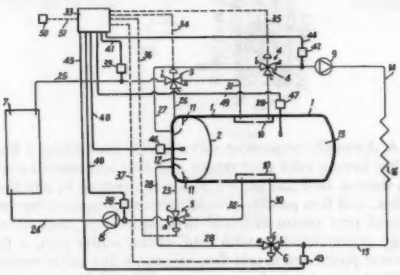
said adjustable screw member providing a means to select the maximum pressure maintained by the pressure regulator.

4,182,489

HEAT TRANSFER SYSTEM

Piero D. Lessieur, Paris, France, assignor to Compagnie Francaise des Petroles, Paris, France

Filed Aug. 23, 1977, Ser. No. 827,052
Claims priority, application France, Aug. 23, 1976, 76 25509
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—422 **50 Claims**



37. Apparatus for effecting heat transfer between an intermittent source of thermal energy and utilisation means comprising:

a reservoir for heat exchange fluid comprising two compartments whose volumes are complementarily variable;

means for changing the enthalpy of said heat exchange fluid;

utilisation means whose temperature is to be changed by heat transfer with said heat transfer fluid;

means for determining which one of said compartments contains heat transfer fluid whose temperature is closer to the temperature of fluid circulating from said enthalpy changing means;

a first input circuit for connecting said enthalpy changing

means to one of said compartments of said reservoir in response to said determining means;

a first output circuit for connecting said enthalpy changing means to said one compartment in response to said determining means;

a second input circuit for connecting said utilisation means to said one compartment in response to said determining means; and

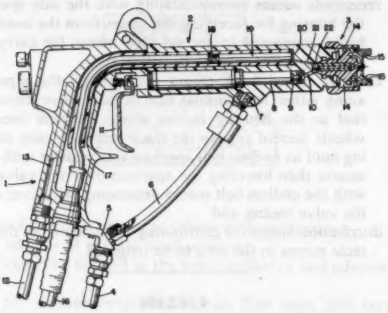
a second output circuit for connecting said utilisation means to said one compartment in response to said determining means.

4,182,490

ELECTROSTATIC SPRAY GUN

James L. Kennon, Avon, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Feb. 13, 1978, Ser. No. 877,445
Int. Cl.[2] B05B *5/02*
U.S. Cl. 239—3 **22 Claims**



1. An electrostatic coating apparatus comprising:

a nozzle portion made from substantially nonconductive material, having a fluid discharge opening and effective to project a dispersed cloud of coating material therefrom;

a small electrode extending from said nozzle portion;

a coating material conduit in communication with said fluid discharge opening;

a high voltage electrical path passing through the nozzle portion and adapted to connect said electrode to a source of high voltage electrical power; and

at least a first series resistor in said electrical path located in said nozzle portion said first series resistor being in at least the megohm range.

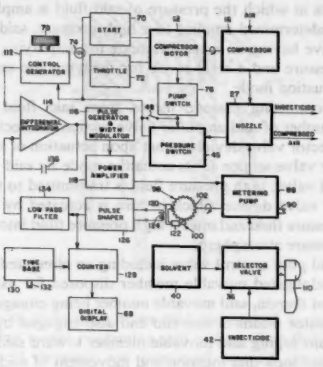
4,182,491

REMOTE CONTROL SPRAYING APPARATUS

James G. Parke; Richard O. Norman; Edward D. Colle, and Edsel M. Fussell, all of San Antonio, Tex., assignors to Micro-Gen Equipment Corp., San Antonio, Tex.

Filed Mar. 25, 1977, Ser. No. 781,530
Int. Cl.[2] B05B *7/26*
U.S. Cl. 239—11 **14 Claims**

1. Spraying apparatus for spraying accurately controlled amounts of liquid into the atmosphere without direct measurement of the liquid flow, said apparatus comprising a source of said liquid, a nozzle through which said liquid is sprayed, conduit means extending between said source and said nozzle and liquid pumping means interposed along said conduit means, said liquid pumping means comprising a metering pump of the positive displacement type, the liquid flow through which corresponds directly to its operational speed, a pump shaft connected to said pump, remote sensing means connected to said pump shaft to detect the pump shaft speed, said remote sensing means comprising an electrical signal generator arranged to produce electrical flow rate signals in direct relationship to the rotational speed of said pump shaft and further comprising a remote display for remotely displaying said electrical flow rate signals, a control generator arranged to be adjusted at said remote display and settable to produce control signals and electrical circuit means comprising a differential



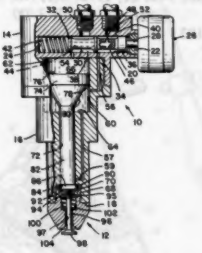
detection circuit connected to receive said control signals and said flow rate signals and to produce an adjustment signal corresponding to the difference between said control and flow rate signals and means for changing pump speed in accordance with said adjustment signal.

4,182,492

HYDRAULICALLY OPERATED PRESSURE AMPLIFICATION SYSTEM FOR FUEL INJECTORS

Albert A. Albert, Bellevue, and Kenneth W. Porter, Mercer Island, both of Wash., assignors to Combustion Research & Technology, Inc., Tukwila, Wash.

Filed Jan. 16, 1978, Ser. No. 869,517
Int. Cl.[2] F02M *47/02*
U.S. Cl. 239—92 **8 Claims**



1. A fluid injector actuator and pressure amplification mechanism for an injector, comprising:

(a) an injector valve device for injection of fluids into a high pressure atmosphere,

(b) an actuator/amplifier housing connected to said injector valve device and including a pilot control valve section having a fluid inlet opening for admission of pressurized fluid thereto and a fluid exhaust opening for exiting of fluid therefrom, said pilot control valve further being connected by fluid transfer passages to and adapted to control flow of pressurized fluid to and from a pressure amplifier valve section, said pilot control valve also having a first position for effecting an actuation mode in an amplifier valve and a second position for effecting a reset

mode in said amplifier valve, and further including actuator means for control of said pilot control valve,

(c) said housing also containing an amplifier valve section operatively connected to said pilot control valve by said fluid transfer passages for receiving pressurized fluid from said pilot valve, and including a fluid charging chamber area in which the pressure of said fluid is amplified by a predetermined amount to a high pressure, said amplifier valve having an actuation mode for amplifying said fluid pressure and a reset mode for readying the same for its actuation mode,

(d) connecting passage means from said fluid charging chamber of said amplifier valve section connected to said injector valve device so that upon actuation of said amplifier valve section to its actuation mode by said pilot control valve, high pressure fluid is transmitted to said injector valve device which in turn is actuated by said high pressure fluid and injects high pressure fluid into said high pressure atmosphere,

(e) said pilot control valve including an elongated bore and an elongated movable member disposed for axial movement therein, said movable number being engaged by said actuator means at one end and also engaged by resilient means urging said movable member toward said actuator means such that location and movement of said movable member to said first position and to said second position are determined by said resilient means and said actuator means, said movable member being a spool having spaced apart lands defining an annular first cavity means for receiving fluid from said fluid inlet and defining an annular second cavity means for returning fluid to said exhaust opening, and

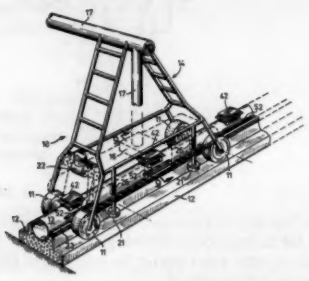
(g) said spool including a central axial passage opening out of and extending from one end of and through the spool and terminating in closed spaced relationship to the other end thereof and further including at least one transverse passage opening from said central passage into said second cavity for returning fluid to said exhaust opening.

4,182,493

SELF-PROPELLED IRRIGATION APPARATUS

Larry C. Murray, Rte. 4, Box 405, Idaho Falls, Id. 83401

Filed Feb. 21, 1978, Ser. No. 879,890
Int. Cl.[2] B05B *3/00*
U.S. Cl. 239—183 **9 Claims**



1. A self-propelled irrigation apparatus comprising in combination:

elongate pipe means extending along an area to be irrigated and being connected to a source of pressurized water;

a plurality of spaced-apart normally closed valve means disposed along the upper side of said pipe means, each of said valve means having lever means for being depressed to open gate means in said valve means to permit the flow of water through the valve means;

self-propelled trolley means for moving along said pipe means;

valve-actuating means mounted on said trolley means for actuating said valve means, including housing means mounted on wheels and having an aperture along its underside for communicating with the upper side of said elongate pipe and having at least one additional aperture along a vertical side, said housing being vertically-moveably mounted on said trolley means to permit vertical motion with respect to the trolley means as the trolley and valve-actuating means move along the pipe means;

endless belt means mounted within the housing on a plurality of roller means and being driven by a drive roller at the same speed as the self-propelled trolley means, said belt means having a plurality of apertures on the surface thereof in register with and for encircling said valve means on said elongate pipe means, and being covered by flexible members to hold the apertures normally closed, the belt means being water-tight along the edges thereof with the side of the housing within the interior perimeter of the belt means;

receptacle means communicating with the side aperture in the housing for receiving the water from the housing and being connected to second pipe means for carrying the water to the area to be irrigated; and

elongate raised track means disposed on the pipe means along either longitudinal side of said valve means; such that as the housing moves along the pipe means, the wheels thereof engage the track means to raise the housing until an endless belt aperture is in register with a valve means, then lowering the aperture over the valve means with the endless belt means depressing said lever to open the valve means; and

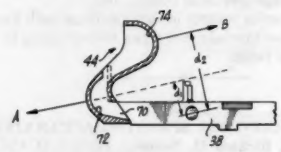
distribution means for distributing the water from the receptacle means to the area to be irrigated.

4,182,494

ANTI SIDE SPLASH DRIVE ARM FOR AN IMPACT DRIVE SPRINKLER

William J. Wichman, Glendora, and Robert W. Patterson, Huntington Beach, both of Calif., assignors to Anthony Manufacturing Corp., Azusa, Calif.

Filed Feb. 13, 1978, Ser. No. 877,375
Int. Cl.[2] B05B *3/14*
U.S. Cl. 239—230 **15 Claims**



1. In an impact drive sprinkler of the type having a body with a sprinkler nozzle through which water is ejected from the sprinkler in a forward direction, and an oscillating spring biased impact arm having a reaction member which is repeatedly deflected laterally away from a rest position intercepting the water ejected by the nozzle, then biased back to the rest position to impact the body and effect rotation of the body through a preselected arc by small angular increments, the improvement comprising:

a rearwardly facing arcuate deflector surface on the reaction member for diverting water issuing from the nozzle through a first angle of at least about 120 degrees laterally and rearwardly from said forward direction; and

a forwardly facing arcuate deflector surface on the reaction member for receiving diverted water from said rear-

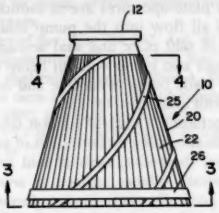
wardly facing deflector surface and having a portion disposed a substantial distance rearwardly of said rearwardly facing deflector surface for redirecting the diverted water forwardly to a direction substantially parallel with said forward direction, whereby water issuing from the nozzle is substantially confined to the preselected arc through which the sprinkler is rotated.

4,182,495

GRAPHITE OR CARBON FIBER COMPOSITE STRUCTURE, LOW TEMPERATURE CURE

Donald E. Borgmeier, and Edward W. Higgs, both of Salt Lake City, Utah, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 4, 1978, Ser. No. 966,238
Int. Cl.[2] B63H *11/00*; B32B *31/00, 7/00*; D03D *9/00*
U.S. Cl. 239—265.11 **3 Claims**



1. A rocket nozzle exit cone subassembly comprising:
(a) an adaptor of annular configuration;
(b) an exit cone bonded to the inner surface of said adaptor; and
(c) a net of preimpregnated carbon fiber tape, said tape having a low temperature cure epoxy resin system, wrapped about said exit cone and said adaptor so that when cured said net is firmly bonded to said exit cone and said adaptor.

3. A construction method comprising the steps of:
(a) applying a low temperature cure epoxy resin to the surface of a material combination;
(b) laying up a plurality of strips of a preimpregnated carbon fiber tape, said tape having a low temperature cure epoxy resin system, to form a predetermined net about said material combination; and
(c) curing said material combination with said net at a low temperature.

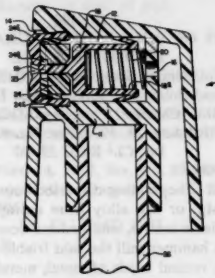
4,182,496

ACTUATOR BUTTON FOR FLUID DISPENSER

James E. Burke, Huntington, Conn., assignor to Ethyl Products Company, Baton Rouge, La.

Filed Dec. 16, 1977, Ser. No. 861,310
Int. Cl.[2] B05B *11/04*
U.S. Cl. 239—492 **10 Claims**

1. A pressure operated actuator button assembly for a finger operated fluid dispenser comprising:
a. an actuator button having:
i. a generally cylindrical compression chamber means having two ends;
ii. inlet channel means communicating with said compression chamber means for conveying pressurized fluids to be dispensed to said compression chamber means;
b. an orifice located in one of said ends of said compression chamber means through which fluids exit from said compression chamber means to the atmosphere;
c. piston means slidably received in said compression chamber means, said piston means having pin means for sealing said orifice and scaling collar means slidably received in said compression chamber means for containing fluids to be dispensed in said compression chamber means between said scaling collar means and said orifice; and
d. resilient means for biasing said piston means towards said orifice and for allowing said piston means and said pin



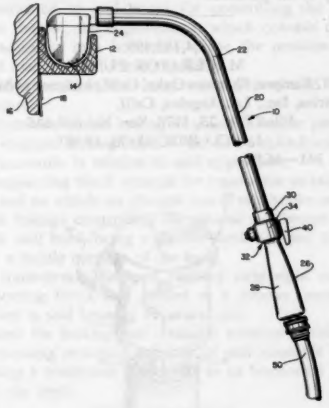
means to slide away from said end of said compression chamber means containing said orifice when fluids under sufficient pressure are conveyed to said compression chamber means through said inlet means to allow fluids to be dispensed through said orifice.

4,182,497

GUTTER CLEANING DEVICE

Richard A. Ferreira, 82 Taunton Ave., and Manuel J. Brito, 32 Colonial Rd., both of East Providence, R.I. 02914

Filed Jan. 9, 1978, Ser. No. 868,070
Int. Cl.[2] B05B *9/08*
U.S. Cl. 239—532 **4 Claims**



1. A gutter cleaning device adapted to remove leaves and other debris from an elevated roof gutter or the like, comprising an elongated generally tubular hollow member having a lower end adapted to be held by a person manipulating said device and an upper end adapted to reach the gutter when the device is in operative position, a working head attached to said member upper end, said working head of generally hollow closed integral construction and having sidewalls and a lower end wall defining a lower terminal portion adapted to downwardly extend into said gutter, said lower end wall being imperforate and shaped for substantial conforming contact with the inner lower surface of said gutter, at least one of said sidewalls including a plurality of fluid discharge openings extending therethrough and adapted to direct fluid longitudinally along said inner gutter surface so as to force leaves and

debris therealong, said head having internal means for interconnecting said hollow handle with said discharge openings whereby fluid directed into said handle passes outwardly of said device through said openings.

4,182,498

RECOVERY OF ROUND METAL GRANULES FROM PROCESS SLUDGE

William M. Goldberger; Bhupendra K. Parekh, both of Columbus, Ohio, and Bobby P. Faulkner, New Berlin, Wis., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 25, 1978, Ser. No. 936,979
Int. Cl.[2] B02C *23/00*
U.S. Cl. 241—24 **14 Claims**

1. A method of separating dispersed rotund beads of metal, metal alloy, Mg, or Mg alloy from entrapment in a frozen, contiguous, friable matrix, said process comprising

feeding to a hammer mill the said friable maxrix containing dispersed, rotund beads of metal, metal alloy, Mg or Mg alloy thereby breaking up the matrix and releasing the entrapped beads of metal, the so-released beads of metal being characterized by a relatively-thin coating of the matrix remaining thereon and substantially retaining their rotundity,

screening the material from the hammer mill to collect the fraction which passes through an 8 mesh screen and is retained on a 100 mesh screen,

subjecting the collected fraction to a gentle grinding to further pulverize the matrix agglomerates without destroying the thin matrix coating adhering to each metal bead and without substantially destroying the rotundity of the metal beads,

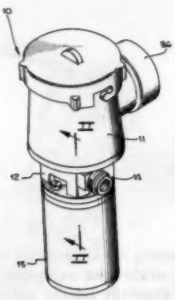
subjecting the so-ground material to a shape classifier whereby the material is classified according to the rotundity of the particles.

4,182,499

MACERATOR PUMP

James M. Kemper, Sherman Oaks, Calif., assignor to Monogram Industries, Inc., Los Angeles, Calif.

Filed Feb. 23, 1976, Ser. No. 660,646
Int. Cl.[2] B02C *18/06, 18/40*
U.S. Cl. 241—46.02 **6 Claims**



1. A macerator vacuum pump grinder adapted to receive a quantity of sewage material mixed with air to be ground, grind said material, and pump the ground material to a desired location comprising:

a collector housing having an inlet for receiving said material therein;

a positive displacement vacuum pump having an intake coupled to said collector housing and an outlet for pumping ground material out of said pump, said pump having a housing and a source of rotary motion including an impeller with a plurality of radially extending flexible fingers rotatable in said pump housing;

said source of rotary motion including a motor coupled to said pump having a rotatable motor shaft extending through said pump and coupled to said impeller for actuating said pump and terminating in said collector housing and having a cutting blade fixedly mounted on said motor shaft for rotation therewith;

a cutter plate interposed between said pump and said supply of material to be ground separating said collector housing from said pump intake, said plate having a plurality of spaced apertures therein of a predetermined size with said cutting blade being rotatable across said cutter plate and said apertures when said motor is actuated and abutting against said plate;

spring means operatively connected to said motor shaft adapted to bias said blade against the plate so that the blade continually rubs up against the plate whereby said blade and plate apertures are in motion relative to each other and all flow into the pump intake is through the apertures in said plate and said sewage material cannot pass through said pump without being macerated;

said cutting blade being reversible and including a cutting edge on both sides thereof; and

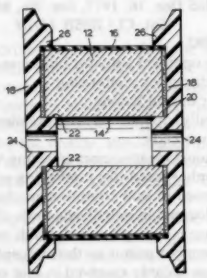
said blade including a central portion fixed to said shaft, a pair of arms extending on both sides of said central portion and integral therewith, each of said arms having a first upper generally planar surface, a second downwardly extending generally planar surface forming a substantially right angle with said first planar surface, a third generally planar surface extending downwardly and inwardly of said respective arm from said second planar surface, a forth generally planar surface extending away from said third planar surface and at substantially an oblique angle thereto, a fifth planar surface extending from said fourth planar surface, said fifth planar surface lying in a plane generally parallel to the plane of said first planar surface, a sixth planar surface extending from said fifth planar surface and forming substantially a right angle with respect thereto, said sixth planar surface lying in a plane generally parallel to said third planar surface, and an eighth planar surface extending from said seventh planar surface to said first planar surface, said eighth planar surface lying in a plane generally parallel to the plane of said fourth planar surface, the intersection of all of said planar surfaces forming cutting edges.

4,182,500

OPTICAL WAVEGUIDE SHIPPING SPOOL

Melvin C. Schlicker, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 20, 1978, Ser. No. 926,498
Int. Cl.[2] B65H *75/14*
U.S. Cl. 242—118.7 **3 Claims**



1. A spool for low expansion filament comprising

a cylindrically shaped barrel formed of a first material having a thermal coefficient of expansion no greater than 125×10^{-7}/°C.,

a layer of resilient foam material disposed around the circumference of said barrel,

a flange at each end of said barrel, said flanges extending radially beyond the surface of said layer, said flanges being formed of a material different than said first material, and having lands which extend over the edges of said layer, and

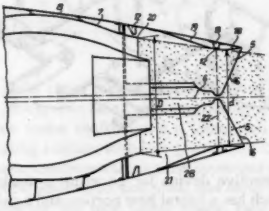
a layer of resilient bonding material is disposed between the ends of said barrel and the corresponding surfaces of said flanges.

4,182,501

THRUST REVERSER FOR JET ENGINE FORMING ACTIVE EXTENSION OF JET TUBE

Etienne Fage, Jouy en Josas, France, assignor to Astech, Meudon La Foret, France

Continuation-in-part of Ser. No. 784,562, Apr. 4, 1977, Pat. No. 4,129,269. This application Feb. 24, 1978, Ser. No. 881,044
Claims priority, application France, Mar. 4, 1977, 77 06360
The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.
Int. Cl.² B64C *15/06*; B64D *33/04*
U.S. Cl. 244—110 B **6 Claims**



1. A thrust reverser adapted for use with an aircraft jet engine having a jet exhaust pipe, said reverser comprising two symmetrical doors, each of which is at least substantially hemi-truncated in form, having opposed arcuate leading and trailing edges and opposed rectilinear side edges,

said doors being mounted to pivot about an axis adjacent said trailing edges, said axis being transverse and substantially diametrical with respect to the jet of said engine, and which is disposed downstream of the jet exhaust pipe thereof,

each of said doors comprising a thin wall having a concave inner face and a convex outer face, and

elongated reinforcing members attached to said concave face adjacent the arcuate leading and trailng edges and the rectilinear side edges thereof, said reinforcing members projecting inwardly from said concave face,

said wall having a crescent-shaped section at its rearward end, defined by the trailing edge of said wall and said reinforcing member adjacent thereto, said section having an inner concave and an outer convex face which form continuations of the concave and convex faces of said wall,

an arcuate lining having two faces which intersect to form a trough having an approximately V-shaped cross-section, said lining spanning the reinforcing member adjacent the trailing edge of said door with said reinforcing member in the trough of said lining, said lining faces comprising a rearward face covering substantially all of the concave face of said crescent-shaped section and a forward face covering less than half of the concave face of said wall,

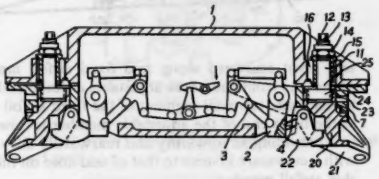
each door being movable between a first, folded position in which said outer face forms an extension of a section of said aircraft, and a second, unfolded position in which said outer face is disposed transversely with respect to said jet, said rearward faces forming, in the folded position of said doors, a converging extension of said jet pipe having a substantially circular rear port with a diameter smaller than the exit diameter of said jet pipe.

4,182,502

DEVICE FOR THE BEARING HARMONIZATION OF AN AIRBORNE LOAD

Jean H. Hasquenoph, Lagny sur Marne, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, Valenton, France

Filed Nov. 14, 1977, Ser. No. 850,883
Claims priority, application France, Nov. 16, 1976, 76 34428; Nov. 3, 1977, 77 33061
Int. Cl.² B64D *1/02*
U.S. Cl. 244—137 R **11 Claims**



2. In a system for releasably suspending a load from an aircraft, having a housing structure carried by the aircraft, a pair of longitudinally spaced hooks within said housing and pivotally movable between a position engaging the load for the suspension thereof and a position releasing said load, and link means connected to said hooks for controlling the pivotal movement thereof, the improvement which consists of a device for adjusting in a horizontal plane the position of the suspended load, said device comprising:

(i) a socket movable in a longitudinal slot of said housing structure,

(ii) a rotatable member having a cylindrical upper part rotatably engaged through said socket and a cylindrical lower part eccentric in relation to said upper part;

(iii) a supporting block secured for translation to said lower part and on which are pivoted one of said hooks and a bell crank linkage controlling the pivotal movement of said hook, said hook being a double hook adapted to co-act with a saddle member of the load,

(iv) a transversely disposed packing strip rigid with said supporting block and guided in a groove transversely formed in said housing structure, and

(v) means for locking said rotatable member in relation to the housing structure, rotation of said rotatable member causing a transverse movement in an horizontal plane of said one hook.

4,182,503

VARIABLE AIRFOIL ASSEMBLY

Ralph P. Muscatell, 2007 NE. 20th Ave., Fort Lauderdale, Fla. 33305

Continuation-in-part of Ser. No. 768,640, Feb. 14, 1977, abandoned. This application Jun. 9, 1978, Ser. No. 914,673
Int. Cl.² B64C *3/48, 9/32*
U.S. Cl. 244—219 **7 Claims**

7. In a variable airfoil assembly having:

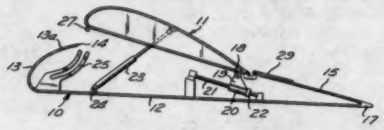
a fixed airfoil member with a bottom wall, a convex nose extending upward and curving rearward from the front end of said bottom wall to a top wall segment which terminates in a transverse edge at the front of a recess in the top of the fixed airfoil member above said bottom wall; and an adjustable airfoil member in said recess pivotally

mounted away from its front end for adjustment between a fully lowered position fitting in said recess and raised positions in which its front end extends up from the top of said fixed airfoil member, said adjustable airfoil member having a top surface which provides a smooth continuation of said top wall segment of the fixed airfoil member in front of said recess when the adjustable airfoil member is in its fully lowered position;

the improvement which comprises:

a slidable pivot for said adjustable airfoil member;

and means supporting said pivot to position the front end of the adjustable airfoil member beneath said top wall segment of the fixed airfoil member in said fully lowered position of the adjustable airfoil member and for sliding



said pivot rearward along said fixed airfoil member to retract the front end of the adjustable airfoil member from beneath said top wall segment of the fixed airfoil member as the front end of the adjustable member is raised;

means providing an upwardly and rearwardly curved track with a curvature inverse to that of said nose on the adjustable airfoil member;

and a follower slidable along said track;

said track and said follower acting between said fixed and adjustable airfoil members to guide the front end of said adjustable airfoil member from beneath said top wall segment of the fixed airfoil member as said pivot is slid rearward and the front end of the adjustable airfoil member is raised.

4,182,504

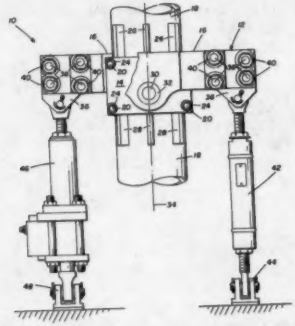
BALANCED SNUBBER APPARATUS

Frank L. Bernhard, Salt Lake City, Utah, assignor to E-Systems, Inc., Dallas, Tex.

Filed May 5, 1978, Ser. No. 902,910

Int. Cl.[2] F16L *3/10*; F16F *15/02*

U.S. Cl. 248—49 **6 Claims**



1. Apparatus for providing axial support to a pipe having a centerline and for suppressing axial shock loads in the pipe, said apparatus comprising:

a walking beam including an inner portion for attachment to the pipe, and an outer portion pivotally connected to the inner portion about an axis extending through the centerline of said pipe;

said inner and outer portions of the walking beam each comprising first and second sections secured to one another to facilitate attachment of said walking beam about said pipe;

a rigid link support pivotally connected to one side of the outer portion of said walking beam a predetermined distance from the pivotal connection between the inner and outer portions of said walking beam; and

a snubber support means pivotally connected to the other side of the outer portion of the walking beam opposite to said rigid link support a predetermined distance from the pivotal connection between the inner and outer portions of said walking beam, said snubber support having a suitable predetermined lock-up rate so that the pipe is yieldably supported upon relatively small rates of axial displacement and rigidly supported upon relatively greater rates of axial displacement such as that caused by a shock.

4,182,505

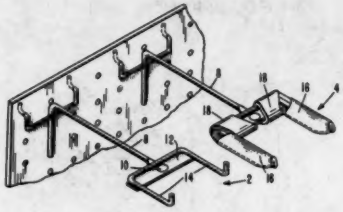
MUSICAL INSTRUMENT HANGER AND COVER THEREFOR

Robert B. Cobin, 426 7th Ave. South, Nashville, Tenn. 37203

Filed May 26, 1978, Ser. No. 910,039

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—220.4 **8 Claims**



1. A protective device for covering a musical instrument hanger which has a lateral base portion and a pair of longitudinal extensions which provide therebetween a space for receiving the musical instrument,

said device having an H-shape which includes a pair of parallel legs and a central crosspiece connecting said legs,

each of said parallel legs having a tubular body extending in one direction from said crosspiece for covering said longitudinal extensions to prevent said extensions from marring a musical instrument supported thereon,

each of said parallel legs including retaining means extending in the other direction from said crosspiece and attached to said tubular bodies for preventing inadvertent removal of said tubular bodies from their respective longitudinal extensions,

said retaining means being elongated and flexible to permit it to be wrapped around said lateral base portion of the hanger to retain its associated tubular body on a said longitudinal extension to provide a protective covering on said lateral base portion,

a fastener on said retaining means for holding said retaining means in wrapped relation on said transverse base portion when the respective said tubular body is on a said longitudinal extension.

4,182,506

LOAD-LEVELING BASE

Clark E. Boveia, Little Rock, Ark., assignor to Clark-Way Leveling Systems, Inc., Benton, Ark.

Filed Mar. 13, 1978, Ser. No. 885,891

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—656 **1 Claim**

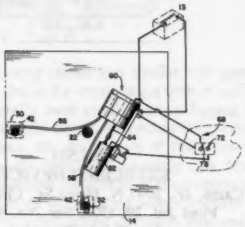
1. An improved base for supporting a leveled load comprising:

A. a horizontally oriented plate having an upper surface

adapted to receive in supporting relation a load characterized by a center of mass substantially centrally related to the plate;

B. support means for supporting said plate for oscillatory motion about a pair of normally related pivotal axes intersecting a vertically oriented load axis passing through the center of the plate including a vertically oriented load-bearing post surmounted by an integrally related ball and characterized by a longitudinal axis coincident with said load axis, means defining in the center of said plate an inverted socket concentrically related to said load axis receiving the ball in mated relation, and means defining a keeper for securing said ball in said socket;

C. means for pivotally displacing said plate about a selected one of said pivotal axes, while simultaneously supporting said plate against pivotal displacement about the other pivotal axis of said pair, including one pair of jack screws



spaced 90° apart about the longitudinal axis of said post, each of the jack screws being characterized by a vertically oriented jack screw shaft having a linear axis extended into intersecting relation with one pivotal axis of the pair of pivotal axes, means connecting the upper end of each of said jack screw shafts with said plate, and drive means for axially displacing the jack screw shafts, each independently of the other, including a pair of worms connected in driving relation with the jack screw shafts, and means for driving said worms in rotation, each independently of the other, including an electrically energizable motor, a flexible drive shaft connected to each worm of said pair of worms, and transmission means for selectively connecting each drive shaft of said pair of drive shafts to said motor; and

D. means including an electrical circuit for selectively energizing said motor.

4,182,507

MOLD FOR CASTING ARTICULATED CASTINGS FROM REGISTERED DENTAL IMPRESSIONS

Ivan Bekey, 517 Erskine Dr., Pacific Palisades, Calif. 90272, and Roger S. Wolk, 28 Malibu Colony Dr., Malibu, Calif. 90265

Division of Ser. No. 745,712, Nov. 29, 1976. This application Nov. 13, 1978, Ser. No. 960,380

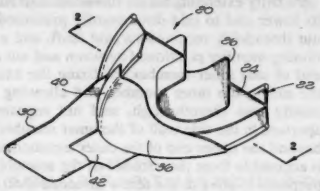
Int. Cl.[2] A61C *11/00*

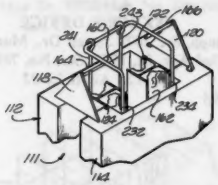
U.S. Cl. 249—54 **6 Claims**

1. A casting mold adapted to receive a dental tray for simultaneously casting registered upper and lower dental impressions contained in the dental tray, the dental tray having a substantially U-shaped wall around part of each impression, and at least one non-porous, bite-deformable septum, comprising:

two end pieces; and,

means for providing at least one seal between the dental tray and an inner contour of the mold so that two separate cavities are formed, each cavity being partially defined by one of the dental impressions contained within the dental tray and an adjacent mold end piece and being separated





from the other cavity by said at least one non-porous septum and seal.

4,182,508

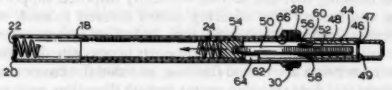
BICYCLE SEAT SUPPORTING MEANS

Charles Kallai; Valerie Kallai, and Charles Kallai, Jr., all of Woodbridge, Canada, assignors to Hamilton Mould Tool & Die Limited, Weston, Canada

Filed Jan. 23, 1978, Ser. No. 871,633

Int. Cl.[2] B62J *1/02*

U.S. Cl. 267—132 **3 Claims**



1. A bicycle seat supporting means comprising:

an elongated tubular outer member adapted to be clamped in a bicycle frame member, said outer member having an open upper end and a lower end provided with a spring seating formation;

an elongated tubular inner member slidable within the outer member, the upper end of said inner member protruding through the open upper end of said outer member and adapted to receive a bicycle seat clamped thereto, the inner member including a downwardly presented formation disposed interiorly thereof and adjustable along the length thereof.

a compression spring seated at one end against the spring seating formation of said outer member and at the other end against the downwardly presented formation of said inner member, said spring urging against downward movement of the inner member within the outer member;

locking means mounted on the upper portion of said outer member and including a laterally inwardly extending protrusion manually movable between a first, locking position in which it enters and engages an aperture in a side wall of said inner member to prevent relative sliding movement between the inner member and the outer member, and a second, unlocking position in which the protrusion clears the inner member permitting said relative sliding movement;

said inner member including adjusting means for adjusting

the position of the downwardly presented formation therein, to vary the tension in the compression spring, said adjustment means including:

an upwardly extending screw threaded shaft fixed secured at its lower end to said downwardly presented formation, a nut threadably received on said shaft, and a tubular positioning member positioned between said nut and the upper end of said inner member for fixing the axial position of the nut in the inner member and allowing said shaft to axially pass therethrough, said nut registering with an aperture in the side wall of the inner member at a location beyond the upper end of the outer member, so that the nut is accessible from the exterior of the assembly for turning purposes relative to the screw threaded shaft, to adjust the tension in the spring.

4,182,509

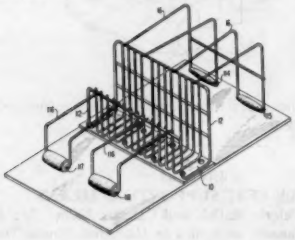
EXERCISE DEVICE

Thomas M. Chupp, Jr., 2479 Jewell Dr., Marietta, Ga. 30066

Filed Apr. 21, 1977, Ser. No. 789,588

Int. Cl.[2] A63B *23/02*

U.S. Cl. 272—93 **5 Claims**



1. An exercise device comprising a flat base adapted to rest on the floor, a substantially U-shaped frame secured to said base defining first and second vertically disposed supports and first and second foot securing means secured to each of said supports, respectively; said foot securing means extending laterally outwardly from said supports in opposite directions in spaced relation above said flat base, and said flat base extending beyond said foot securing means in each direction, each of said foot securing means including at least one horizontal bar parallel to said base and each other so that two people facing each other may secure their feet under a respective bar for simultaneous use of the exercise device.

4,182,510

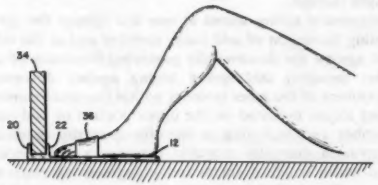
EXERCISE SHOE SIT-UP APPARATUS

Robert C. Lundell, 2044 Western Ave. North, Roseville, Minn. 55113

Filed Aug. 21, 1978, Ser. No. 937,191

Int. Cl.[2] A63B *23/02*

U.S. Cl. 272—93 **4 Claims**



1. A foot restraining device for use during sit-up exercises comprising:

(a) a platform member having a front edge, a rear edge and two generally parallel longitudinally extending side portions integrally formed therewith and projecting generally perpendicular thereto, said side portions being higher proximate said rear edge than at said front edge, such that said platform member is inclined upward by a predetermined angle from said front edge to said rear edge when said side portions are resting on a floor;

(b) first and second parallel and spaced apart ribs integrally formed with and extending upward from said platform member proximate said front edge thereof for engaging the bottom edge of a door on opposed sides thereof;

(c) a pair of slots formed through said platform member and extending parallel to said side portions; and

(d) a strap passing through said pair of slots for engaging the bridge of a user's foot to bind said foot to said platform member with the heel and ball of said foot resting on said platform member.

4,182,511

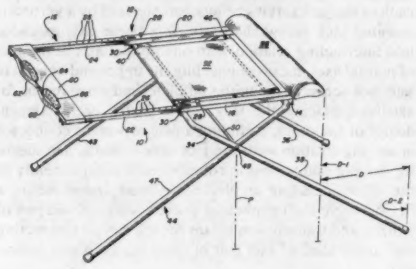
EXERCISER DEVICE

Hope H. Camp, Jr., 2047 N. Howe St., Chicago, Ill. 60614

Filed Jul. 20, 1978, Ser. No. 926,479

Int. Cl.[2] A63B *23/02*

U.S. Cl. 272—145 **4 Claims**

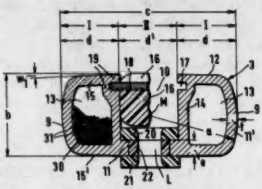


1. An exerciser device for conditioning lower back and abdominal muscles, comprising a rectangular frame adapted to support the lower portion of the torso and the legs of an occupant, a pair of support leg means for supporting said rectangular frame, said support leg means including a first pair of support legs pivotally mounted with respect to the rectangular frame and a second pair of support legs pivotally mounted with respect to the first support leg, said rectangular frame including a generally U-shaped first frame member having a pair of parallel arms and a fixed crosspiece, a second U-shaped frame member arranged to be co-planar and opposing said first frame member, with the second frame member comprising a pair of parallel arms arranged in a telescoping relation to the first pair of arms of the first frame member, and the second frame member including a fixed second crosspiece, means securing said opposed ends of said arms of said frame members relative to each other at a selected one of a number of relative positions, flexible means interconnecting said first and second pair of support legs to limit the pivotal movements thereof relative to each other whereby said support legs can be collapsed to a generally co-planar and parallel configuration or can be pivoted to said limit position where said pairs of support leg means provide a planar horizontal support for said rectangular frame.

4,182,512
RACKET FOR PLAYING TENNIS OR SIMILAR BALL GAMES

Siegfried Kuebler, Uberlingen, Fed. Rep. of Germany, assignor to Kuebler & Co., Singen, Fed. Rep. of Germany

Filed Sep. 22, 1976, Ser. No. 725,363
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1975, 2554267
Int. Cl.[2] A63B 49/04
U.S. Cl. 273—73 C 10 Claims



1. A racket for playing tennis and similar ball games, said racket comprising: a frame for mounting a web of strings, said frame being of generally oval configuration having a major and a minor axis, a straight handle extending from one lengthwise end of said frame, the major axis of the frame and the center axis of the handle defining a common axis, lengthwise frame portions substantially parallel to said common axis having at least one chamber of reduced size compared to said frame portions on both sides of said common axis; and a multitude of granules freely movable relative to each other partly filling said chambers, said granules being of substantially smaller size than the chamber to enable said granules to move relative to one another and to said chamber in all directions, the crosswise and lengthwise widths of said chambers and the quantity of granules therein being so correlated that the granules in response to swinging of the racket are activated and propelled substantially crosswise to said common axis within the limits of the widths of said chambers thereby damping vibrations and frequencies generated in the frame and the handle by abrupt swinging of the racket and/or the impact of a ball on the web in the frame, said frame comprising two parallel ovally curved hollow rods and means joining said rods in parallel but crosswise spaced relationship, each of said rods including said at least one said chamber partly filled with said granules in said lengthwise frame portions substantially parallel to said common axis, and filler means disposed between said rods for engaging said strings between said rods, said joining means including means for securing said filler means to the frame.

4,182,513
BOW AND ARROW

Richard A. Henderson, 5041 Jade, Wichita, Kans. 67216

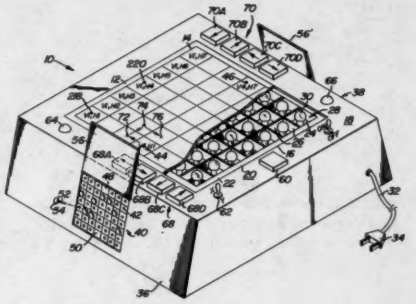
Filed Jan. 16, 1978, Ser. No. 869,676
Int. Cl.[2] F41B 5/02
U.S. Cl. 273—106.5 C 6 Claims

1. An improved arrow for use in combination with an archery bow, said arrow comprising:
an elongate, generally cylindrical shaft having a point at one end, a string-receiving nock at the opposite end, and a center of gravity intermediate said ends;
at least one fletch extending radially outwardly from said shaft adjacent said opposite end; and
airfoil structure mounted on said shaft intermediate said ends in alignment with the normal direction of flight of said arrow for improving the flight range and accuracy thereof as well as increasing the resultant force on impact,
said structure intersecting a transverse right sectional plane passing through said shaft at said center of gravity.

4,182,514
PRE-PROGRAMMABLE OBSTACLE POSITIONING ELECTRONIC GAME

Donni Magid, 923 Tyson Ave., Roslyn, Pa. 19001, and Zelig Z. Magid, 460 Parlin St., Philadelphia, Pa. 19116

Filed May 31, 1977, Ser. No. 801,888
Int. Cl.[2] A63F 9/14
U.S. Cl. 273—237 16 Claims



1. A game, comprising:
a board provided with plural discrete positions thereon including a predetermined target position;
first means for indicating the position of a player on the board;
second means operable by said player for selectively advancing the position of said player on said board in either of at least two transverse directions; and
programmable third means pre-programmable for selectively inhibiting said second means from advancing the position of said player to preselected board positions from any adjacent position and for indicating that said second means is inhibited.

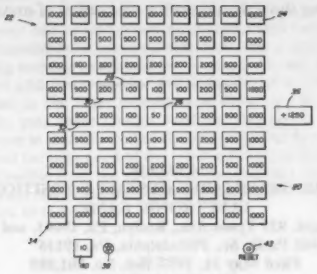
4,182,515
MATHEMATICAL GAMEBOARD

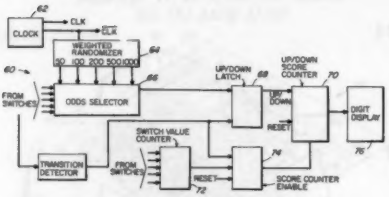
Joseph J. Nemeth, 104 Providence Ave., Doylestown, Pa. 18901

Filed May 1, 1978, Ser. No. 901,554
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—237 19 Claims

1. A gameboard for use in mathematical games of chance comprising:
a playing surface;
a plurality of depressable keys on said playing surface, each of said keys having a numerical value embosses thereon;
means responsive to said keys for generating a signal;
weighted randomizing means for receiving said signals from said depressed keys and for randomly assigning a positive

or negative value thereto as a function of the numerical value;





means to determine and display the cumulative values of the keys depressed by a player using said gameboard;

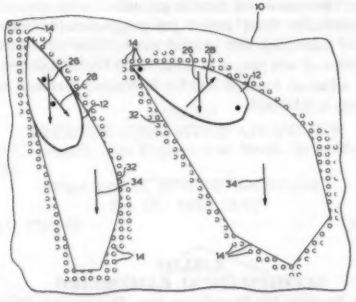
means to reset said gameboard at the conclusion of a game.

4,182,516

SAILBOAT RACING GAME

Douglas C. Gill, 1191 Newton Rd., Oakville (L6H 2A1), Ontario, Canada

Filed May 8, 1978, Ser. No. 903,532
Int. Cl.[2] A63F *3/00, 9/00*
U.S. Cl. 273—258 **6 Claims**



1. A sailboat racing game apparatus comprising:

a base board having thereon, intersecting rows of first interfitting connecting means, each of said interfitting connecting means being spaced from its adjacent neighbor by predetermined units of distance so as to define a grid pattern on said base board;

at least two similar sets of sailboat representing playing pieces, each of said playing pieces having a bow end and a stern end, and being provided with a pair of spaced apart second interfitting connecting means for releasably interconnecting with the first interfitting connecting means on said base boards;

each playing piece of a set having predetermined spacing between its pair of second interfitting connecting means, thereby permitting registry of the playing piece on the base board with its connecting means interfitting with the first connecting means on the base board, at a predetermined angle to the directions of the rows of said first interfitting connecting means;

each playing piece bearing indicia denoting the angle of registry of said playing piece with the direction of the rows of interfitting connecting means in the base board when the second interfitting connecting means of said playing piece are correctly received in said first interfitting connecting means of the base board;

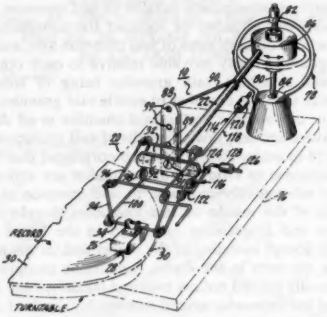
and including a wind shadow designating means adapted to be releasably mounted on the upper surface of a playing piece of a said set.

4,182,517

ARTICULATED PARALLELOGRAM PHONOGRAPH TONEARM

Adam N. Rosenberg, Dept. of Operation Research, Stanford Univ., Stanford, Calif. 94305

Filed May 15, 1978, Ser. No. 906,127
Int. Cl.[2] G11B *3/12*
U.S. Cl. 274—23 R **6 Claims**



1. An articulated tonearm apparatus for minimizing the effects of warp on the surface of a phonograph record played on a turntable, said apparatus comprising:

a mounting means for attaching said apparatus to said turntable, said mounting means including a pivot means;

a beam connected to said pivot means and constrained by said pivot means to rotate in a plane substantially parallel to the surface of said phonograph record;

a flexible multi-pivot parallelogram means connected to said beam at a point removed from said pivot means said parallelogram means including:

a first base means connected to said beam and held in a relatively rigid position with respect to the surface of said phonograph record, said first base means having at least two corners thereon;

at least two linkage means respectively connected to at least two of said corners of said first base means; and,

a second base means having at least two corners thereon, at least two of said corners of said second base means being connected to the ends of said at least two linkage means furthest removed from said first base means, wherein said second base means always lies in a plane substantially parallel to the plane of said first base means;

a phonograph cartridge means connected to said second base means; and,

a stylus means attached to said cartridge means for detecting

information on the surface of said record, said stylus means being connected to said second base means in such a fashion as to be constrained to travel in an arc having a virtual center which lies substantially on the surface of said record.

4,182,518

SEALING ARRANGEMENTS

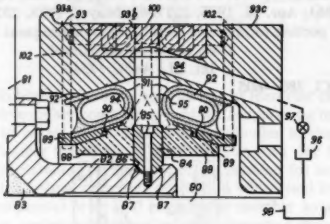
Thomas W. Bunyan, London, England, assignor to Pilgrim Engineering Developments Limited, London, England

Filed May 23, 1978, Ser. No. 908,777

Claims priority, application United Kingdom, Feb. 3, 1978, 4438/78

Int. Cl.[2] F16J *15/36, 15/54*

U.S. Cl. 277—65 **10 Claims**



1. A sealing arrangement for a rotary shaft mounted in bearings and structure surrounding said shaft, said sealing arrangement comprising:

two rubbing seals mounted between the shaft and structure supporting the shaft including parts carrying the rubbing surfaces of each seal, said parts being mounted for relative movement towards and away from one another and resiliently biassing means for biassing said parts into contact with one another; said parts including a flange with radial surfaces carried on said shaft and two rubbing rings carried by said structure and surrounding said shaft, said rings being mounted for axial movement relative to the flange, said biassing means biassing said rings toward said flange and for each seal one of said rubbing surfaces being formed by a radial surface of said flange, the other rubbing surface being provided by one of said rings; two conical rings, each conical ring carrying a respective one of the rubbing rings, two conical surfaces on the supporting structure, and two resilient flexible hinge rings, each hinge ring being stressed to have a generally U-shaped cross-section with inner and outer limbs, the inner limb of each hinge ring being secured to a respective one of the conical rings which carry the rubbing rings and the outer limb of each ring being supported against a respective one of the conical surfaces on the supporting structure;

a void space between said seals; and

means for indicating ingress of liquid into said void space.

4,182,519

RESILIENT SEALING RING

Ralph Wilson, 20 Keats St., Sunnybank, Queensland 4109, Australia

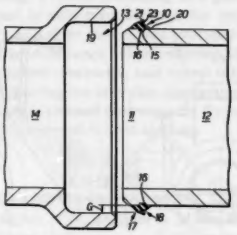
Filed Jul. 24, 1978, Ser. No. 927,293

Claims priority, application Australia, Jan. 24, 1978, PD3123

Int. Cl.[2] F16L *17/02;* F16J *15/10*

U.S. Cl. 277—207 A **14 Claims**

1. A seal for a socket type pipe joint formed between the spigot end of a pipe and the socket end of an adjoining pipe, said seal being in the form of a resilient sealing ring adapted to be located at the end of one said pipe and slid into operative engagement with the other said pipe for location between the spaced outer surface of the spigot end of one pipe and the inner surface of the socket end of the overlapping pipe, said ring including a locating portion adjacent its operative leading end having a transverse or radial dimension sufficient to operatively position said socket end and said spigot end in their operative substantially concentric relationship, and said ring tapering from said locating portion towards said leading end and at the trailing end of said ring a pair of diverging annular



fins each adapted to diverge towards a respective one of said inner surface of said socket end or said outer surface of said spigot end, and said ring having an abutment portion extending therearound and adapted to be engaged behind a shoulder of said one pipe to fixedly locate said ring with respect to said one pipe.

4,182,520

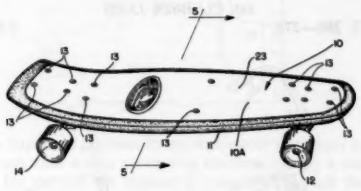
SKATEBOARD STRUCTURE

Richard L. Stevenson, 738 Loma Vista, El Segundo, Calif. 90245

Filed Jul. 24, 1978, Ser. No. 927,150

Int. Cl.[2] A63C *1/00*

U.S. Cl. 280—87.04 A **6 Claims**



1. A skateboard structure comprising a platform formed of a top piece and a bottom piece separate from one another; a bumper extending around the periphery of the platform and having an integral web section extending between the top piece and the bottom piece of the platform; and a plurality of bolts extending through the top piece and the bottom piece for securing the top piece and the bottom piece of the platform together and for clamping the web section of the bumper therebetween.

4,182,521

MOTORIZED DELIVERY TRICYCLE

Francois Durand, and Christian Guillem, both of Antibes, France, assignors to Institute de Recherches et d'Etudes de Techniques Specifiques, Antibes, France

Filed May 4, 1977, Ser. No. 793,763

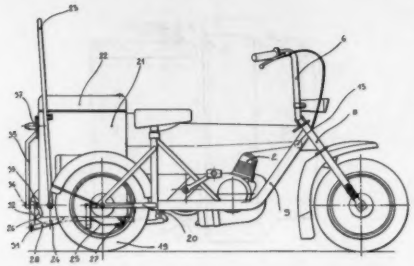
Claims priority, application France, May 10, 1976, 76 14524

Int. Cl.[2] B62J *11/00*

U.S. Cl. 280—202 **1 Claim**

1. A tricycle comprising a chassis having a front wheel and two rear wheels, a support (28) carried by said chassis and extending below the axes of the rear wheels, said support having a load locking element (27) thereon, a detachable load carrying box (21) on said support, the axes of the rear wheels intersecting said box, the box having rollers thereon and at least one member (25) engaging with the load locking element

(27) to limit forward movement of the box relative to the chassis, a projection (26) on the load carrying box, and a locking device releasably maintaining said member (25) in engagement with the load locking element (27) of the chassis support, said locking device comprising an abutment (33) articulated on

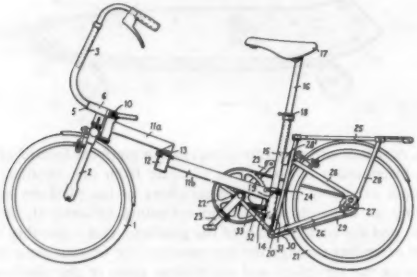


the chassis engaging with said projection (26) to press said member (25) of the load carrying box (21) against the load locking element (27), an arm (35) for swinging said abutment, and means (37) for releasably locking said arm on the back of the load carrying box to retain the load carrying box on the tricycle support.

4,182,522
FOLDING BICYCLES

Andrew W. Ritchie, 53 Egerton Gardens, London, England (SW3)

Filed May 6, 1977, Ser. No. 794,519
Claims priority, application United Kingdom, May 7, 1976, 18950/76
Int. Cl.[2] B62K *15/00*
U.S. Cl. 280—278 **9 Claims**

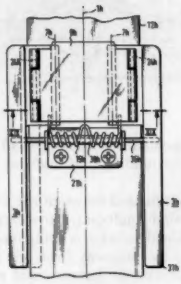


1. A folding bicycle comprising:
(a) a main frame member;
(b) a front frame including a steerable front wheel assembly; and
(c) a rear wheel assembly, including a rear wheel;
(d) a saddle;
(e) pivot means on said main frame interconnecting said main frame member and said rear wheel assembly whereby said rear wheel assembly can pivot relative to said main frame member in the plane of said rear wheel into a folded position in which the axle of said rear wheel is located beneath said main frame member; and
(f) means interconnecting said front frame and said main frame assembly whereby said front wheel assembly may be moved on folding into a position in which said front wheel lies substantially alongside said rear wheel when the said rear wheel assembly is in its folded condition; and
(g) a strut carried by and slidable relative to said main frame member into a raised position and a lowered position and supporting said saddle; said strut, when in its lowered position, and when said rear frame assembly is in its folded position, lying in the path of said rear wheel assembly to prevent the latter moving into its unfolded position.

4,182,523
SKI BRAKE

Tilo Riedel, Eching, Fed. Rep. of Germany, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France

Division of Ser. No. 678,706, Apr. 20, 1976, Pat. No. 4,123,083, which is a continuation-in-part of Ser. No. 666,232, Mar. 12, 1976, abandoned. This application Jun. 1, 1978, Ser. No. 911,327
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1975, 2512052; Apr. 22, 1975, 2517794; Apr. 22, 1975, 2517820; Apr. 22, 1975, 2517829; Apr. 22, 1975, 2517838; Apr. 22, 1975, 2517861; Apr. 22, 1975, 2517862; May 2, 1975, 2519779
The portion of the term of this patent subsequent to Oct. 31, 1995, has been disclaimed.
Int. Cl.[2] A63C *17/10*
U.S. Cl. 280—605 **6 Claims**



1. A brake for an elongated ski having an upper surface and a pair of sides, said brake comprising:
a support securable to said upper surface of said ski;
pivot means on said support defining a horizontal pivot axis generally parallel to said surface and transverse to said ski;
an elongated brake element at one side of said ski and having an upper end portion, a lower end, and an intermediate portion, one of said portions being secured to said pivot means for pivoting of said element about said horizontal axis between a braking position extending transverse to and downwardly past said ski and a rest position extending generally parallel to and lying above said surface, said element further being movable on said pivot means in said rest position between a ready position in which said lower end is spaced laterally relative to the longitudinal direction of said ski from said one side of said ski and a retracted position in which said lower end overlies said surface;
a pivot spring engaged between said element and said support and urging said element into said braking position; and
actuating means including a link connected substantially directly to said element and an actuating member connected substantially directly to said link, bearing through said link on one of said portions transversely of said longitudinal direction and generally parallel to said surface, and displaceable generally perpendicular relative to said surface from an up position relatively far from said surface to a down position relatively close to said surface for displacing said element about said horizontal axis from said braking position into said rest position and along said horizontal axis from said ready position into said retracted position.

4,182,524

SAFETY SKI BINDING

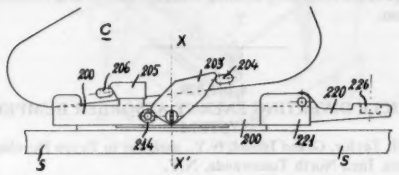
Jean A. J. Beyl, Nevers, France, assignor to Look S.A., Nevers, France

Filed Aug. 14, 1978, Ser. No. 933,634

Claims priority, application France, Aug. 26, 1977, 77 26029; Mar. 10, 1978, 78 06942; Jun. 16, 1978, 78 18056

Int. Cl.[2] A63C 9/081

U.S. Cl. 280—618 **22 Claims**



1. Safety ski binding for a ski boot having at least one external engageable member comprising a ski boot supporting member adapted to rotate about a pivot perpendicular to the ski surface and having the shape of a flat case, at least one boot hooking means mounted on said supporting member for movement between a normal operative position in which said hooking means cooperates with said engageable member so as to hold the latter against movement on said supporting member, and an inoperative position to which said hooking means is moved when an abnormal load is applied to the skier's leg, whereby said boot is released in relation to said supporting member resilient system mounted in said supporting member for urging on the one hand said supporting member to its normal position on the ski and on the other hand said hooking means to its operative position, and means forming a kinematic chain between said supporting member, said hooking means and said resilient system so acting that a movement of rotation of the supporting member which tends to move it away from its normal position is attended by a decrease in the force necessary to release said boot hooking means from its operative position, and that inversely a movement of said hooking means to its inoperative position is attended by a reduction in the force tending to hold the pivoted supporting member against rotation.

4,182,525

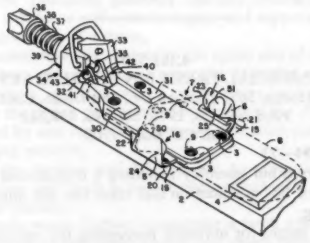
STEP-IN SIDE-CLAMP SAFETY SKI RELEASE SYSTEM

Richard G. Spademan, 1421 Old County Rd., Belmont, Calif. 94002

Filed Nov. 21, 1977, Ser. No. 853,500

Int. Cl.[2] A63C 9/086

U.S. Cl. 280—624 **5 Claims**



1. In a ski binding having a movable clamping member and a clamp-receiving member, including means forming a protuberance and means for engaging said protuberance, said protuberance-engaging means having an edge terminated at each end by an outwardly extending portion forming tip members for releasably engaging said protuberance and a surface which extends inwardly from said tip members toward the midline of said protuberance-engaging means for positioning said protuberance-engaging means relative to said protuberance when said protuberance-engaging means is engaged by said protuberance, an improvement for converting said binding to a step-in binding comprising: a recess extending in a generally vertical direction disposed in said protuberance for receiving one of said tip members as a skier moves said protuberance-engaging means past said protuberance when entering the binding for releasable engagement therewith, said recess serving as a camming surface for moving the movable clamping member as one of said tip members is pressed downwardly through said recess when a ski boot is inserted in said binding.

4,182,526

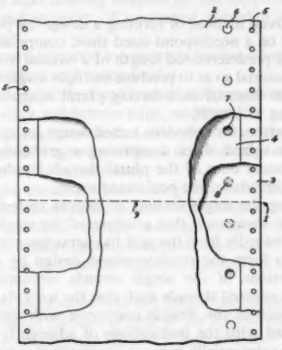
BUSINESS FORMS STATIONERY ASSEMBLY

William Poole, Dover, N.H., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Mar. 20, 1978, Ser. No. 890,638

Int. Cl.[2] B41L 1/20

U.S. Cl. 282—21 R **6 Claims**



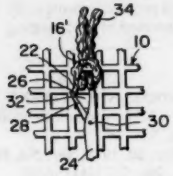
1. An improved business forms continuous stationery assembly for use with a data processing machine having a pin feed tractor for moving the stationery assembly through the machine and comprising:

a plurality of continuous, longitudinal record webs, including a first record web, and at least a second record web, the record webs being disposed one on top of the other and being capable of being folded, along transverse fold lines, in zig-zag fashion, into a pack of alternate folded lengths and being unfolded so that the webs may again assume a straight line position for use in the data processing machine, with each adjacent alternate folded lengths having a common, transverse fold line therebetween and with each of the record webs having a plurality of evenly spaced pin feed apertures therein that are disposed along at least one side marginal edge of the record webs; and

means for permitting relative movement between the record webs in each adjacent alternate folded length when the record webs are folded and unfolded about the common transverse fold line between the adjacent alternate folded length, the relative movement means including: a plurality of paper staple tongues in the outer one of the record webs, as the record webs are folded about the common transverse fold line in each adjacent alternate folded length, the paper staple tongues each having a free end and being arranged so that the free ends of the paper staple tongues in adjacent, alternate fold lengths face toward the transverse common fold line between the adjacent, alternate fold lengths of the stationery assembly; and means for securing the free ends of the paper staple tongues to the other record web so that the record webs may move

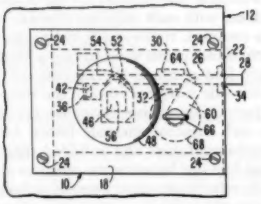
relatively to one another in either direction parallel to the side marginal edge of the record webs.

4,182,527
LATCH HOOKING METHOD
Frances R. Meehan, 793 Twin Rivers Dr. North, East Windsor, N.J. 08520
Filed Apr. 27, 1978, Ser. No. 900,702
Int. Cl.[2] B65H *69/04*
U.S. Cl. 289—1.5 **3 Claims**



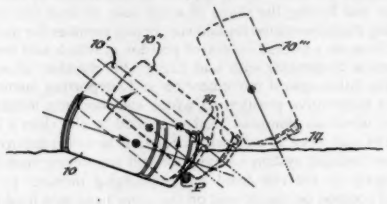
1. An improved method of forming a design by performing latch hooking on a needlepoint-sized sheet comprising:
untwisting a predetermined length of a twisted multi-strand fibrous material so as to produce multiple single strands of the fibrous material each having plural irregular undulations along its length,
defining a pattern for a predetermined design on a perforated needlepoint-sized sheet comprising a grid-like arrangement adjacent ones of the plural threads by designating selected threads on the perforated sheet,
and retaining the single strands of fibrous material to the perforated sheet such that portions of the single strands extend outwardly from the grid-like arrangement of plural threads to form the predetermined design by engaging other portions of the single strands circumferentially about the selected threads such that the irregular undulations of each of the strands cooperate with the selected threads and with the undulations of adjacently retained strands to substantially prevent longitudinal movement of the single strands relative to and to facilitate their retention on the selected threads.

4,182,528
DOOR LOCK
William F. Klay, 541 Seale Ave., Palo Alto, Calif. 94301
Filed Aug. 30, 1977, Ser. No. 829,127
Int. Cl.[2] E05C *1/12*
U.S. Cl. 292—169.17 **2 Claims**



1. A lock for a door having a recess formed in the end thereof intermediate its top and bottom margins comprising: a U-shaped member having a pair of spaced sides and an end wall interconnecting the sides; means engageable with the sides for mounting the member on the door with the sides and end wall enclosing said recess, said end wall having an opening therethrough; a lock bolt having a pair of opposed side margins; means on the inner surfaces of the sides for mounting the side margins of the lock bolt in the space therebetween for movement from an extended, locked position with the ends of the lock bolt extending through and projecting laterally from the outer face of said end wall to a retracted, unlocked position with said one end of the lock bolt inwardly of the outer face of the end wall; means accessible from either side of said member and extending into the space between the sides for moving the lock bolt from said extended position to said retracted position; and means shiftably mounted on at least one of the sides within said space for releasably holding said lock bolt in said extended position.

4,182,529
VEHICLE DIVERTING ENERGY ABSORBER BUMPER SYSTEM
Paul H. Taylor, Grand Island, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.
Filed Jun. 24, 1977, Ser. No. 809,648
Int. Cl.[2] B60R *19/00, 21/14;* **B61F** *19/00;* **B61G** *11/00*
U.S. Cl. 293—132 **17 Claims**

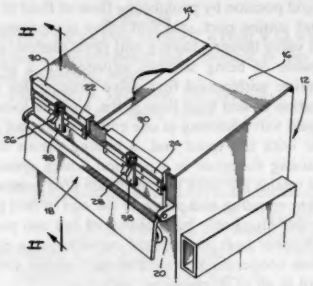


1. An energy management system for a vehicle comprising a vehicle frame, high strength bumper means capable of maintaining its original configuration at the point of impact and having a central portion and outer end portions on opposite sides of said central portion, mounting means mounting said central portion relative to said frame for permitting said outer end portions to effectively swing about said central portion, impact energy absorber unit means effectively mounted between said outer end portions and said frame to thereby absorb the shock of impact while permitting said high strength bumper means to swing about said central portion while maintaining its original configuration outwardly of said central portion toward said outer end portions to thereby deflect said vehicle after impact, said mounting means comprising second impact energy absorber unit means and a pivotal connection between said bumper and said second impact energy absorber unit means, and a second pivotal connection between said second impact energy absorber unit means and said frame.

4,182,530
COMMERCIAL TRASH BIN LOCKING SYSTEM
Allan M. Hodge, 5852 Lomond Dr., San Diego, Calif. 92120
Filed Apr. 20, 1978, Ser. No. 898,382
Int. Cl.[2] B65F *1/00*
U.S. Cl. 294—73 **14 Claims**

13. A trash bin assembly including a commercial trash bin and a lid or lids mounted on said trash bin, the improvement comprising:
locking means for normally preventing the opening of said lid or lids by unauthorized persons when said trash bin is in the upright orientation;
means for disabling said locking means and permitting said lid to swing open when said trash bin is dumped; and
means operable only by authorized persons for unlocking said locking means to permit the opening of said lid when

the trash bin is in the upright orientation; whereby the authorized users of said trash bin have exclusive access to



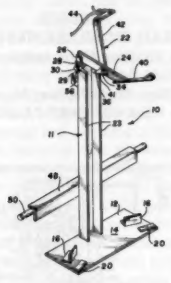
deposit trash in said bin, and there is no delay in the normal dumping of said trash bin.

4,182,531

DRUM HANDLING APPARATUS

Charles de Szegheo, Rte. 2, Box 79, Middletown, Va. 22645

Filed May 19, 1978, Ser. No. 907,563
Int. Cl.[2] B66C *1/66*
U.S. Cl. 294—90 **11 Claims**



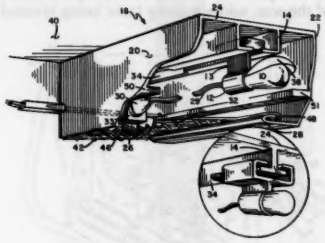
1. Apparatus for handling a drum or the like, comprising:
a frame member having an upper end and a lower end, said frame member having a drum contact surface on the upper end thereof for engaging the upper portion of a drum when it is moved into contact with an upstanding drum to tilt said drum,
base support means attached to the lower end of said frame member extending generally laterally outwardly therefrom a distance sufficient to engage and support a portion of the bottom of a drum,
latch means movably secured to the upper end of said frame member and extending generally laterally outwardly therefrom, said latch means comprising a latch engagable with the upper portion of a drum when the drum is engaged by said contact surface and said latch means is in a locking position,
means for moving said latch means to a release position wherein said latch is out of engagement with the upper drum portion,
said latch means further comprising a latch arm pivotally mounted on the upper end of said frame member above said drum contact surface and movable in a plane substantially through said frame axis between said locking position and said release position, said latch being mounted on said latch arm and extending downwardly therefrom, and
attaching means on said frame member for permitting attachment of said apparatus to a lift mechanism.

4,182,532

VEHICLE ROOF SUPPORT MEMBER

Frank S. Walker, Sr., 5831 NW. 17th Pl., Sunrise, Fla. 33313

Filed Feb. 1, 1978, Ser. No. 874,152
Int. Cl.[2] B62D *63/08*
U.S. Cl. 296—137 R **1 Claim**



1. A truck trailer roofing support bow member comprising:
a unitary light housing adapted for the support of said truck roof and support of protected movable lights therein having:
(a) a planar elongated top member having a top, bottom, and parallel first and second sides;
(b) an elongated first and second side members, each having a top edge and bottom edge, said first side member affixed at a top edge to said first side of said top member and said second side member affixed at a top edge of said second side of said top member;
(c) a light track member having a channel member defined therein affixed to the bottom of said top member, said light track member further having defined therein a light holder receipt aperture within a portion of said channel;
(d) a protective screen member having a first and second side;
(e) a first and second laterally extending flange member, said first flange member affixed to the bottom edge of said first side member, said second flange member affixed to the bottom edge of said second side member, said first flange member including a lip member adapted to be hingably attached to said first side of said protective screen member and said second flange member including releasable attachment means to hold the second side of said protective screen to prevent entry of objects into said unitary light housing for the protection of elements contained therein;
(f) a first rib member incorporated upon the interior of said first side member and a second rib member incorporated upon the interior of said second side member;
at least one light bulb member including a holder member adapted, upon the opening of said protective screen member, to be insertable through said light holder receipt aperture and slidably retained to said channel member, said light bulb member adapted not to extend below said first and second side members; and
means to supply electrical power from a power supply to said light bulb member.

4,182,533

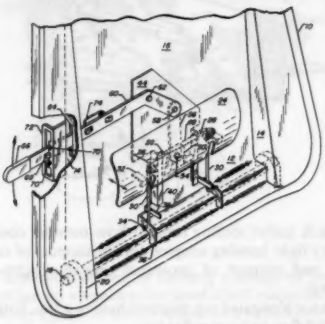
SEAT BACKREST HAVING AN ADJUSTABLE LUMBAR SUPPORT

O. Harold Arndt, Milwaukee, and William L. Wilton, Waukesha, both of Wis., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 26, 1978, Ser. No. 973,200
Int. Cl.[2] A47C *7/46, 3/00*
U.S. Cl. 297—284 **9 Claims**

1. In a seat backrest having a rigid rearwardly positioned frame member and a forwardly positioned resilient upholstered cushion member attached thereto, the improvement comprising a lumbar pad pivotally mounted on a pair of arms which are pivoted relative to the frame member about an axis which

is fixedly mounted relative to said frame member; a first link member pivotally attached at one end to said lumbar pad; a second link member pivotally attached to said first link member at the opposite end thereof; guide means attached to said frame member for restricting the movement of said opposite end of said first link member to a plane generally parallel to the plane of the frame member; a rigid elongated actuating lever having a handle portion at one end readily accessible to an occupant of the seat, said actuating lever being pivoted at one



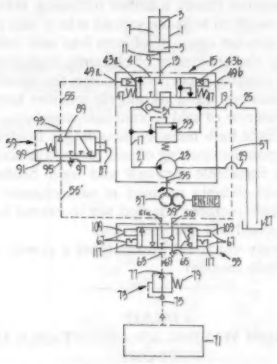
point along its length relative to said frame member, said actuating lever being connected at another point along its length to said second link member so that movement of said lever about said one point will cause said first and second link members to move up and down relative to said guide means and frame member and thereby cause said lumbar pad to move toward said frame member or toward said cushion member; and detent means for selectively locking said actuating lever in various positions in its range of movement.

4,182,534

DIRECTIONAL CONTROL VALVE SYSTEM

David M. Snyder, 4008 N. Lancaster Dr., Muncie, Ind. 47304

Filed Jul. 15, 1977, Ser. No. 816,061
Int. Cl.[2] B60P *1/14*
U.S. Cl. 298—22 C **61 Claims**



1. A mechanism for directing the flow of hydraulic fluid between a work station operable by said fluid and a pump for supplying the fluid under pressure from a fluid reservoir to operate said work station, the mechanism comprising:

a first air actuated valve means for selectively directing the flow of hydraulic fluid under pressure in at least two predetermined paths between a fluid pump port, a fluid work station port and a fluid reservoir port, one of said paths directing fluid from the pump port to the work station port while prohibiting flow to said reservoir port and one of said paths directing fluid between the pump port and reservoir port while retaining the work station in a hold position by prohibiting flow of fluid to or from said work station port, said first valve comprising:

a first valve housing having said ports therein, a valve spool capable of being slidably adjusted to a predetermined position within said first valve housing for the selected creation of said fluid flow paths, a piston located external of said valve housing at one end of said spool and engageable with the spool end, a biasing means for normally retaining the spool in a position which creates said path that retains the work station in said hold position, chamber means encasing said piston at the end of said piston opposite that engagable with said spool end and provided with a chamber port means, said valve housing and chamber means cooperating to enclose said piston and said valve spool in all of its positions, and

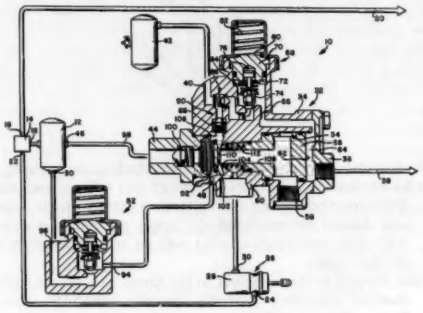
a second valve means for selectively controlling the air actuation of said first valve means, said second valve means comprising a second valve housing having located therein an air inlet port, an air exhaust port and an air outlet port, conduit means for connecting said air outlet port to said chamber port means and means operably located in the flow paths connecting said inlet, exhaust and outlet ports to direct the air in a preselected path thereby to adjust said valve spool to create a desired fluid flow path.

4,182,535

TRAILER BRAKE SYSTEM

Richard C. Fannin, Grafton, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 18, 1978, Ser. No. 943,587
Int. Cl.[2] B60T *13/38*
U.S. Cl. 303—9 **9 Claims**



1. In a vehicle fluid pressure braking system having service brakes actuated by fluid pressure and mechanically applied, fluid pressure released parking brakes, a source of fluid pressure, a pair of reservoirs for storing fluid under pressure, a first flow path communicating said fluid pressure source to one of said reservoirs, a second flow path communicating said one reservoir with the other reservoir, pressure responsive valve means in said second flow path for permitting substantially uninhibited fluid communication to said other reservoir when the pressure level in said second flow path is above a predetermined level but closing to prevent communication through said second flow path when the pressure level therein is below said predetermined level, and a third flow path communicating said other reservoir with said second flow path and bypassing said pressure responsive valve means, check valve means in said third flow path permitting communication from said other reservoir but preventing communication into said other reser-

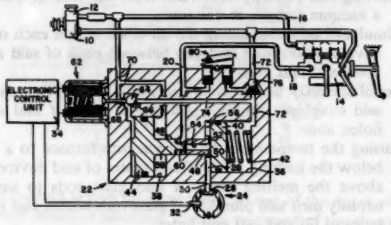
voir, and valve means for controlling communication between said reservoirs and said parking brakes.

4,182,536

ADAPTIVE BRAKING MODULATOR VALVE

Edward M. Pauwels, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 3, 1978, Ser. No. 892,576
Int. Cl.[2] B60T *13/68*
U.S. Cl. 303—115 **1 Claim**



1. In a modulator valve cooperating with a control unit to relieve brake pressure for a wheel assembly when skidding of the latter is imminent, the modulator valve communicating with a pressure source and providing for communication between the wheel assembly and a fluid pressure generator via a passage in the modulator valve, the modulator valve being characterized by a pair of pistons being movably mounted within the modulator valve, one of said pair of pistons forming a portion of the passage and communicating with the pressure source opposite the portion of the passage, the other of said pair of pistons having opposite faces normally exposed to a reservoir, the control unit being activated to close communication between the reservoir and one face of the other piston and open communication between the pressure source and the other face of the other piston, and a sleeve movably disposed within the modulator valve passage, said sleeve abutting said one piston to substantially define a rest position for said one piston, said sleeve also defining a bore for communicating said fluid pressure generator with said wheel assembly and said other piston being normally spaced from said sleeve and movable into engagement with said sleeve when the control unit is activated to close said bore and to move said sleeve and said one piston away from said rest position.

4,182,537

ANTI-FRICTION SUCKER ROD GUIDE ASSEMBLY

Clarence Oster, Pecos, Tex., assignor to Conoco, Inc., Ponca City, Okla.

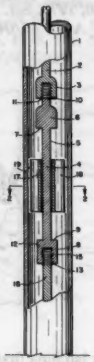
Continuation-in-part of Ser. No. 784,098, Apr. 4, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,605
Int. Cl.[2] F16C *29/00*
U.S. Cl. 308—4 A **6 Claims**

1. An anti-friction sucker rod coupling and guide apparatus comprising in combination:

(a) an elongated polished rod member having a long axis, a standard male fitting on each end, and a polished brass anti-friction surface along its cylindrical length;

(b) a rod box having a shoulder perpendicular to the long axis of the rod member affixed at each end of the rod member for attaching the rod member within a sucker rod string such that the shoulders of the rod boxes form abutments encircling the rod member at each end;

(c) an elongated rod guide, fabricated of an anti-friction organic polymer having an inner bore along its long axis having a smooth surface contacting the polished brass anti-friction surface of the rod member, which is slideably positioned about the rod member, the rod guide having an outer diameter sufficient to functionally contact the inner diameter of a tubing string in which the rod guide is positioned, the rod guide including passageways sufficient to permit passage of produced fluid therethrough, the rod guide having a shoulder perpendicular to the long axis of



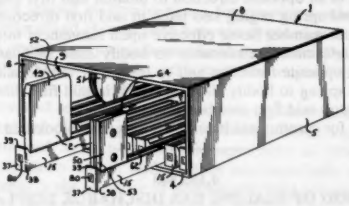
its inner bore at each of its ends adapted for abutment against the shoulders of the rod boxes affixed at each end of the rod member; the rod boxes adapted to maintain the rod guide on the rod member without deformation.

4,182,538

STORAGE MODULE FOR TAPES

Hubert P. Armistead, 1204 Wilkes Blvd., Columbia, Mo. 65201

Filed Mar. 20, 1978, Ser. No. 888,295
Int. Cl.[2] A47B *81/06*
U.S. Cl. 312—12 **8 Claims**



1. A storage module for receiving articles of various external dimensions comprising:

(a) a receptacle having a horizontally extending bottom wall;

(b) a plurality of elongated, parallel, channel-like trays adapted for receipt into said receptacle adjacent said bottom wall;

(c) engagement means respectively associated between said trays and said bottom wall and slidably retaining said trays upon said bottom wall, said trays being selectively movable along said bottom wall to the exterior of said receptacle; and

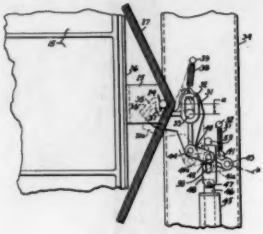
(d) a plurality of partition-forming insert members snugly engaged within a plurality of said trays and having upright portions extending generally transversely and dividing the respective trays into separate compartments spaced along longitudinal axes of respective said trays, said compartments having dimensions commensurate with an external dimension of said respective articles for snugly receiving said articles therein without excessive rattling and wobbling.

4,182,539

LATCHING DEVICE

Richard E. Busch, La Puente, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed Apr. 10, 1978, Ser. No. 895,242
Int. Cl.[2] A47B 88/04, 88/16
U.S. Cl. 312—333 9 Claims



1. A latching device for latching first and second members in a predetermined relationship against a first spring tending to move said first member out of said relationship relative to said second member,

comprising

a latch,

support means supporting said latch for pivotal movement about an axis,

said latch having a latching shoulder engagable with said first member at a location offset from a line extending in the direction of movement of said first member and passing through said axis to latch said first member,

said first spring urging said first member to pivot said latch to unlatch said first member,

blocking means releasably blocking said latch from pivoting,

said support means supporting said latch for bodily sliding movement in a first direction to latch said first member and in an opposite direction to unlatch said first member,

a second spring urging said latch in said first direction,

said first member being effective upon movement into said predetermined relationship to bodily slide said latch in said opposite direction and to thereafter enable said second spring to bodily slide said latch in said first direction to latch said first member, and

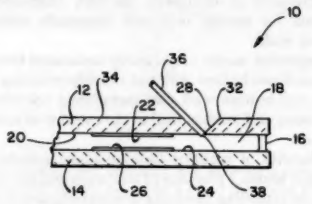
means for causing said blocking means to unblock said latch.

4,182,540

METHOD OF SEALING GAS DISCHARGE DISPLAYS

Roger A. Frankland, Scottsdale, and Henry E. Franklin, Tempe, both of Ariz., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 22, 1977, Ser. No. 863,277
Int. Cl.[2] H01J 9/38, 9/40
U.S. Cl. 316—19 2 Claims



1. A method of making a final seal for a plurality of gas discharge display devices at one time, each of said devices having two insulating plates sealed together in spaced relation to form an enclosed envelope with a plurality of electrodes on at least one of said plates to establish an electrical field for glow discharge of an ionizable gas within said envelope, said method comprising:

making a conical access hole completely through one of said plates of each of said devices;

laying on the side of each of said holes an upright elongated solid rod of low temperature melting point glass within each of said access holes, the cross-sectional area of said rod being smaller than the size of said conical access hole at its smallest end so that a gap is formed between said rod and said hole when said rod is in said hole;

moving said plurality of devices with said rods of glass into a vacuum furnace at one time;

simultaneously evacuating the air from within each of said envelopes through said gap between each of said access holes and said glass rod;

simultaneously introducing said ionizable gas into each of said envelopes through said gap in each of said access holes; and

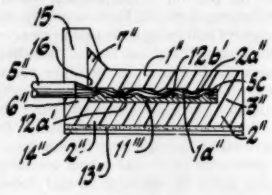
raising the temperature of said vacuum furnace to a point below the melting point of said plates of said devices and above the melting point of said glass rods to simultaneously melt said plurality of glass rods within said access holes to fill and seal said holes.

4,182,541

BURGLAR ALARM FOIL BLOCK

James L. Galaini, 115 Hammler Rd., and Scott G. Kindred, 101 Taylor Ave., both of Somerville, N.J. 08876

Filed Dec. 27, 1977, Ser. No. 864,880
Int. Cl.[2] H01R 9/22
U.S. Cl. 339—125 R 9 Claims



1. A burglar electrical strip device comprising in combination: a first member having a first surface of predetermined area and a second member having a second surface of predetermined area, at least one of said first and second surfaces including at least one raised portion positioned to facilitate clamping pressure at least on one of electrical strip and an electrical wire of an electrical lead; the first and second surfaces being shaped to be adapted for being placed together in substantially face-to-face opposing relationship and in substantial contact with one-another, and further being jointly adapted to receive therebetween both an electrically conductive strip and one or more contact wires of an electrical lead wire in electricl contact with the conductive strip and in an anchored and compressed state between the first and second surfaces, and the first and second members jointly including latching means for latching the first and second members together with the first and second surfaces in opposing relationships.

4,182,542

CLIPLESS CONTACT

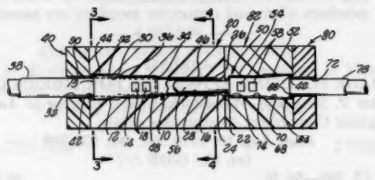
William R. Mattingly, Jr., Santa Ana, Calif., assignor to Matrix Science Corporation, Torrance, Calif.

Filed Jul. 10, 1978, Ser. No. 923,263
Int. Cl.[2] H01R 13/42
U.S. Cl. 339—217 S 5 Claims

4. A connector assembly for attachment to the end of at least one wire comprising:

an insulating support having therethrough at least one passageway having a rear passageway portion with a circular cross section of a first diameter and a central passageway portion with a circular cross section of a second diameter larger than the first diameter, the junction between the rear passageway portion and the central passageway portion defining a rear shoulder; and

at least one electrically conducting tubular shaped connector member each having a front mating region, an electri-



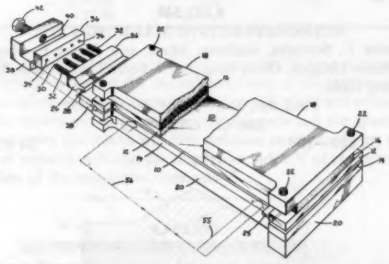
cal contact region for attachment to one of the wires and a rear elliptical retention portion, rearward of the electrical contact region, resiliently deformable to a circular shape for insertion and removal through the rear passageway portion, the elliptical socket retention portion having a rear elliptical edge, the retention portion being positioned in the central passageway portion of the insulating support, the major axis portion of the rear elliptical edge contacting the rear shoulder for preventing withdrawal of the connector member from the insulating support.

4,182,543

RUGGEDIZED ACOUSTO-OPTIC WAVEGUIDE

Dennis N. Wied, Melbourne, and Robert M. Montgomery, Indialantic, both of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Aug. 19, 1977, Ser. No. 825,986
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.13 **19 Claims**



1. A ruggedized acousto-optic waveguide comprising, in combination,

a sheet of glass positioned along a plane,

transducer means, acoustically coupled with said sheet of glass, for generating and propagating acoustic waves through said sheet of glass along said plane,

means for placing said sheet of glass in compression along said plane, and

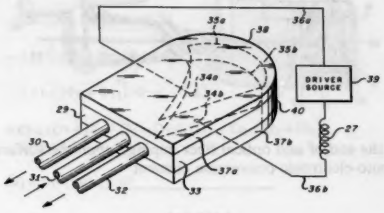
means for inhibiting said sheet of glass from buckling from said plane by applying a compressive force to said glass normal to said plane.

4,182,544

RESONANT MULTIPLEXER-DEMULTIPLEXER FOR OPTICAL DATA COMMUNICATION SYSTEMS

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 3, 1978, Ser. No. 930,773
Int. Cl.[2] G02B 5/14; G02F 1/03; H04J 15/00
U.S. Cl. 350—96.16 **25 Claims**



1. An optical switching device comprising

a plate of electrooptically active material having first and second opposed major surfaces,

said plate having a focal surface substantially perpendicular to said opposed major surfaces,

said plate additionally having a cylindric surface opposite said focal surface,

cylindrical reflector means opposite said focal surface at said cylindric surface,

at least one light guide means in abutting relation with said focal surface for illuminating a major portion of said reflector means with a diverging light beam,

at least second light guide means in abutting relation with said focal surface and spaced from said one light guide means for collecting a converging light beam reflected by said cylindrical reflector means, and

first and second electrode means for placing a selectable predetermined electric field between opposed portions of said opposed major surfaces whereby substantially all the light from said one light guide means is coupled into said second light guide means,

said first and second electrode means being so shaped as to cause said diverging and said reflected converging light beams each to intersect a spiral-shaped index of refraction discontinuity within said plate of eectrooptically active material in the presence of said electric field for cooperatively deflecting said light beams and for focusing said converging light beam substantially totally into said second light guide means.

4,182,545

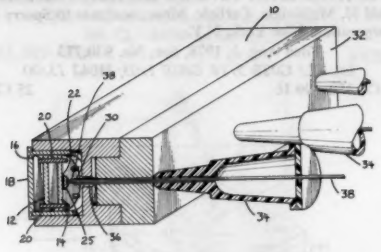
OPTICAL COUPLER SYSTEM

Milton O. Greer, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed May 27, 1977, Ser. No. 801,042
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.20 **4 Claims**

1. A coupler for coupling radiation between an optical fiber and an opto-electronic conversion element comprising a quantity of a solid, hemispherically shaped resilient optically clear material disposed in contact with each of the surface of said conversion element and an end of the optical fiber, the optical fiber being in pressure contact with the resilient material so that a depression is formed at a generally central location on

the spherical surface of the material which forms a seat for the end of the optical fiber, whereby all portions of light emitted



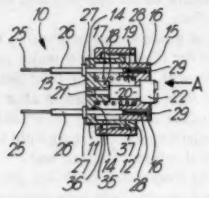
from the end of said optical fiber impinge upon the surface of said opto-electronic conversion element.

4,182,546

MULTIPLE CONNECTOR FOR OPTICAL FIBRES

Helmut H. Lukas, Carleton Place, and Jack F. Dalgleish, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 21, 1978, Ser. No. 880,006
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 **6 Claims**



1. A multiple connector for releasably connecting a plurality of pairs of optical fibres, comprising:

a first connector member and an axially moveable member in the first connector, the moveable member including a plurality of axial bores therethrough;

a second connector member having a plurality of axial bores extending therethrough, each bore in the second connector member aligned with an axial bore in the moveable member to form a plurality of aligned pairs of bores;

a front face on each of said first and second connector members and means releasably connecting and retaining the connector members in an assembled condition with said front faces in contact;

means for resiliently urging said axially moveable member to project from said front face of said first connector member when said connector members are disassembled, said axially moveable member including a front face in contact with the front face of the second connector member in the assembled condition;

a plurality of aligning members in said second connector member, an aligning member in a forward part of each of said axial bores, each alignment member including a central bore of a diameter to be a close fit on an uncoated end of a fiber;

a holding member in each of said axial bores in said moveable member and a holding member in a rear part of each of said axial bores in said second connector member, each holding member including a locating flange intermediate its length;

said locating flanges in engagement with rear faces on each of said connector members;

removeable fastening means attached to said rear faces and engaging with said locating flanges to retain said holding members in said connector members with said locating flanges in contact with said rear faces, and to permit removal and replacement of any holding member;

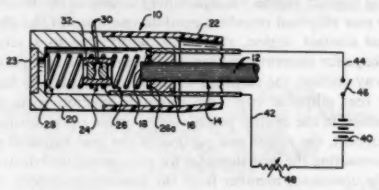
an optical fiber in each holding member, each said holding member attached to a coated portion of a fiber and an uncoated length of fiber extending from a forward end of each holding member for a predetermined distance relative to said locating flange, the ends of pairs of fibers in holding members positioned in said pairs of bores being in opposed substantially abutting relationship in said aligning members when said connector members are assembled.

4,182,547

IMAGE FOCUSING APPARATUS FOR FIBERSCOPES

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 10, 1978, Ser. No. 932,749
Int. Cl.[2] G02B 5/17
U.S. Cl. 350—96.26 **10 Claims**



1. In a fiberscope having a distal objective for focusing images of objects to be observed upon an image-receiving face of an image-transmitting bundle of optical fibers within the fiberscope, the improvement comprising:

an axially adjustable helical support for said objective, said objective being secured to said support at a preselected axial distance away from one end of said support, said end of said support being fixed in said fiberscope adjacent said image-receiving face; and

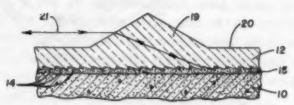
means for selectively effecting axial extension and retraction of said support for providing corresponding positional adjustment of said objective relative to said image-receiving face.

4,182,548

RETROREFLECTIVE MARKING TAPE

Charles E. Searight, Jackson, Miss., and James E. Heasley, Shaker Heights, Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Filed Jul. 5, 1977, Ser. No. 812,851
Int. Cl.[2] G02B 5/12
U.S. Cl. 350—103 **24 Claims**



1. A retroreflective marking material for a roadway and the like comprising in combination:

(a) a substantially continuous sheet having at least some light-transmitting portions, a light-refracting surface on one side adapted to be exposed, and a plurality of trihedral light-reflecting units having three mutually perpendicular facets on the other side,

(b) light-garnering and refracting receptors of polygonal cross-section elevated above and spaced along said one

side of the sheet, and said receptors being free of light-reflecting units on their exposed sides which are co-extensive with said exposed one side of the sheet and adapted to direct light toward said light-reflecting units on said other side of the sheet,

(c) said light-reflecting units being oriented to reflect light striking said exposed side of said sheet at relatively high angles of incidence, and

(d) said sheet being adapted to be directly adhered along said other side to said roadway and the like.

4,182,549

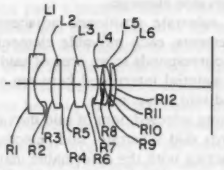
COMPACT WIDE ANGLE LENS

Melvyn H. Kreitzer, Santa Monica, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Sep. 11, 1978, Ser. No. 941,522

Int. Cl.[2] G02B 9/62

U.S. Cl. 350—215 **2 Claims**



1. A compact wide angle lens having a strong negative power front section and strong positive power rear section, according to substantially the following specification:

Surface No.	Radii	Thickness	N	V
1	171.000	2.50	1.607	56.7
2	13.603	7.22		
3	26.710	4.00	1.720	50.3
4	−246.680	5.32		
5	44.448	5.50	1.618	55.2
6	−26.718	4.78		
7	−17.288	1.50	1.785	26.1
8	51.100	1.31		
9	−35.100	2.46	1.720	50.3
10	−16.708	0.2		
11	−81.42	2.20	1.762	40.3
12	−27.96			

wherein the first column lists the surfaces of lens elements numerically starting at the ray entrance side of the system; the second column lists the respective base radii; the third column lists the thicknesses of the respective elements and the spacing therebetween; the fourth and fifth columns respectively list the index of refraction N and the dispersive index V of the optical materials of the respective elements.

4,182,550

MODIFIED GAUSS TYPE LENS SYSTEM

Tamikazu Yamaguchi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 15, 1978, Ser. No. 886,747

Claims priority, application Japan, Mar. 23, 1977, 52-32728

Int. Cl.[2] G02B 9/62

U.S. Cl. 350—215 **4 Claims**

1. A modified Gauss type lens system comprising six separate lens groups consisting, consecutively from the object to the image side, of:

a first front group consisting of a positive meniscus single lens element convex to the object side;

a second group consisting of a positive meniscus single lens element convex to the object side;

a third group consisting of a negative meniscus single lens element convex to the object side;

a fourth group consisting of a meniscus shaped doublet element concave to the object side formed by cementing negative and positive sub-elements;

a fifth group consisting of a positive meniscus single lens element concave to the object side; and

a sixth rear group consisting of a positive single lens element,

wherein the lens system fulfills the following conditions:

$$-0.4<(\Phi_4+\Phi_5)f<-0.24$$

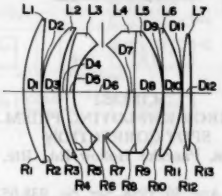
$$-1.21<(\Phi_1+\Phi_3)/\Phi_6<-1.12$$

$$-1.21<(\Phi_9+\Phi_{11})/\Phi_7<-1.13$$

$$0.85<(D_7+D_8+D_9+D_{10})/(D_1+D_2+D_3+D_4+D_5)<1.1$$

$$N_3<1.67,\ N_4<1.67$$

$$\nu_4<\nu_3$$



$$-0.1<f/R_8<0.2$$

wherein:

R_i represents the radius of curvature of the i-th refractive surface counted from the object side;

D_i represents the i-th axial distance (i.e., airspace or lens thickness) counted from the object side;

N_i represents the refractive index with respect to d-line of the i-th glass material counted from the object side;

ν_i represents the Abbe number of the i-th glass material counted from the object side;

Φ_i represents the refractive power of the i-th refractive surface counted from the object side, the refractive power Φ_i being defined by the radius of curvature R_i of the i-th refractive surface, the refractive index n of the medium on the object side of the i-th refractive surface and the refractive index n' of the medium on the image side of the i-th refractive surface as follows:

$\Phi_i=(n'-n)/R_i$; and

f represents the focal length of the whole lens system.

4,182,551

ELECTROCHROMIC DISPLAY DEVICE

Hiroshi Washida, Kawasaki, and Hiroshi Morita, Machida, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1977, Ser. No. 860,856

Claims priority, application Japan, Dec. 20, 1976, 51-151950; Mar. 31, 1977, 52-35463

Int. Cl.[2] G02F 1/17

U.S. Cl. 350—357 **19 Claims**

1. An electrochromic display device comprising:

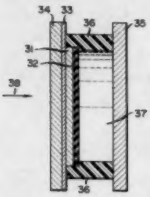
a substrate;

a conductive electrode formed onto said substrate;

a protective layer formed onto said conductive electrode,

said protective layer for preventing said conductive electrode from being corroded by an electrolyte;

a porous layer of an electrochromic material formed on said protective layer;



a counter electrode formed apart from said porous layer; and

an electrolyte disposed between said porous layer and said counter electrode.

4,182,552

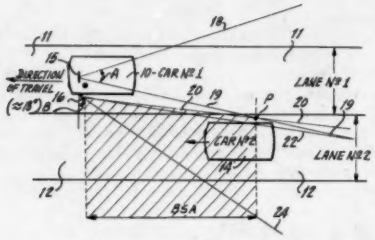
SIDE VIEW MIRROR EMPLOYING PRISM FOR BLIND SPOT CORRECTION

William Feinbloom, Pancake Hollow Rd., Rte. 2, Highland, N.Y. 12328

Filed Aug. 30, 1978, Ser. No. 938,052

Int. Cl.[2] G02B *5/08*

U.S. Cl. 350—303 **1 Claim**



1. In combination with a side view mirror of a vehicle, said side view mirror having a relatively planar reflecting surface and positioned on the side of said vehicle near the position of the vehicle driver for providing visual access to the rear of said vehicle, said side view mirror operative in conjunction with a conventional rear view mirror located within said vehicle to enable said driver to view traffic conditions at the rear of said vehicle, said mirrors undesirably providing a blind spot area in said visual field of view at the driver's side of said vehicle, the improvement therewith of apparatus, comprising:

correction means coupled to said side view mirror at an angle with respect thereto of between six to ten degrees to provide a visual field of view for said driver determinative of said blind spot area to thereby enable said driver to have visual access to said blind spot area, wherein said correction means comprises a glass prism positioned over a portion of said planar surface with the base of said prism facing out from the driver's side of the vehicle, the base angle of the prism being between six to ten degrees, whereby refraction of light by the glass prism is employed to provide correction of said blind spot area.

4,182,553

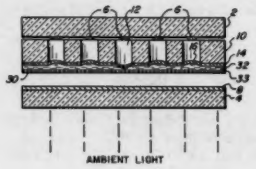
HONEYCOMB DISPLAY DEVICES

Nicholas K. Sheridon, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 19, 1978, Ser. No. 870,700

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—336 **9 Claims**



1. An optical display comprising:

an array of movable elements,

a transparent substrate positioned adjacent said array of movable elements, each movable element occupying an area which corresponds to an area of said display,

a deformable material interposed between said transparent substrate and said array, and

means for causing selected ones of said movable elements to move towards said substrate, said selected movable elements interacting with the deformable material in an area corresponding to said selected movable element whereby the optical characteristics of the deformable material which has interacted with said movable elements differs from the optical characteristics of the deformable material in the areas corresponding to the non-selected movable elements, the area of the display corresponding to the area occupied by said selected elements differing in contrast from the area of the display corresponding to the area occupied by the non-selected elements when said display is exposed to ambient light through said transparent substrate.

4,182,554

MOTION-PICTURE SOUND FILM PROJECTOR

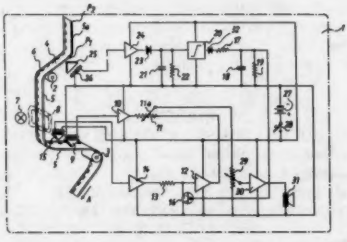
Richard Wick, Munich, and Eduard Wagensonner, Aschheim, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Oct. 28, 1977, Ser. No. 846,582

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2649031

Int. Cl.[2] G03B *31/00, 31/02*

U.S. Cl. 352—5 **11 Claims**



1. In a motion-picture sound film projector in which motion-picture sound film is transported along a predetermined path and is provided with an audio track consisting of recorded track segments alternating with unrecorded track segments, in combination, sound-reproducing means operative for receiving audio signals and converting them into audible sound;

adjustable mixing means having an output connected to the input of the sound-reproducing means and having first and second inputs for receipt of first and second audio signals, and operative for mixing received first and second audio signals with an adjustable balance as between the first and second audio signals; a first audio head located along the film transport path and operative for converting the audio information on the audio track of the film into a first audio signal; first audio-signal transmission means forming a first signal-transmission path extending from the first audio head to the first input of the mixing means; second audio-signal transmission means for transmitting to the second input of the mixing means a second audio signal and forming a second signal-transmission path extending to the second input of the mixing means; controllable attenuating means connected in the second signal-transmission path and controllable for attenuating the transmission of signals through the second signal-transmission path; and control means operative for controlling the operation of the controllable attenuating means, the control means including a control audio head, the control audio head being located along the film transport path a predetermined distance upstream of the first audio head and being operative for sensing the presence of recorded audio information on the recorded sections of the audio track of the film and generating a signal indicative of such presence, and time-delay means connecting the output of the control audio head to the controllable attenuating means and operative for introducing into the response of the attenuating means to the signal produced by the control audio head a time delay whose duration corresponds to the time required for the film to be transported said predetermined distance.

4,182,555

AUTOMATIC FOCUSING SYSTEM FOR USE IN CAMERA

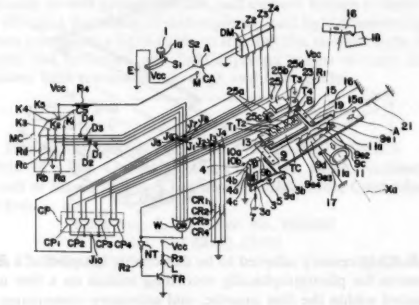
Toshinori Imura, and Akira Yamanaka, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 24, 1978, Ser. No. 954,173

Claims priority, application Japan, Dec. 9, 1977, 52-148422

Int. Cl.[2] G03B *3/10*

U.S. Cl. 354—25 **10 Claims**



1. An automatic focusing system for use in a photographic camera, which comprises, in combination:

distance measuring means for producing a zone signal indicative of one zone of distance where a target object to be photographed is located, said one zone of distance being selected from a plurality of zones relative to the camera;

a discriminator coupled to said distance measuring means for producing, when said distance measuring means produces said zone signal, an actuating signal;

an objective lens movable from a locked position to one of a plurality of focal positions relative to a focal plane of the camera for focusing on said focal plane an image of the target object located within said zone;

releasing means for releasing said objective lens from said locked position upon receipt of said actuating signal;

manual switch means for energizing the distance measuring means; and

control means for controlling the position of the objective lens automatically in accordance with said zone signal.

4,182,556

CAMERA INDICATION DEVICE

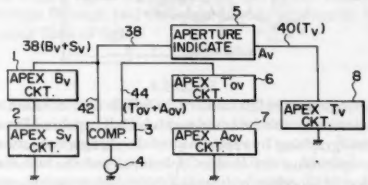
Eiichi Tano, Kamifukuoka, and Shinji Urata, Tachikawa, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1978, Ser. No. 955,743

Claims priority, application Japan, Oct. 28, 1977, 52-144649[U]

Int. Cl.[2] G03B *17/18*

U.S. Cl. 354—60 L **6 Claims**



1. An indication device in a single lens camera of through-the-lens automatic exposure control type comprising;

an aperture control circuit for controlling an aperture utilizing inputs of measured object brightness (B), predetermined film sensitivity (S) and a manual shutter speed (T);

a shutter-control circuit means for effectuating stopped-down metering using an aperture value (A) generated by said aperture control device; wherein an actual aperture value controlled by said aperture value (A) and an actual shutter speed are automatically set according to the object brightness (B) and film sensitivity (S) to have a suitable exposure value, and the aperture value (A) is determined according to the following equation:

$$Av=Sv+Bv-Tv$$

where

Av is the APEX indication value of the aperture value (A);

Sv is the APEX indication value of the film sensitivity;

Bv is the APEX indication value of the object brightness (B); and

Tv is the APEX indication value of the manual shutter speed (T);

a camera shake limit indication device; whereby said aperture value generated is the full-aperture value (A_O) of a photographing lens, light metering is effectuated with the full-aperture value (A_O) and, comparator means such that when the shutter speed (T) controlled by the shutter control device according to the object brightness (B) and film sensitivity (S) is at a camera shake limit speed (T_O), a camera shake limit indication is effectuated under the following condition:

$$Sv+Bv<A_{Ov}+T_{Ov}$$

where A_{Ov} is the APEX indication value of the full-aperture value (A_O), and T_{Ov} is the APEX indication value of the camera shake limit speed.

4,182,557

SINGLE LENS REFLEX CAMERA CAPABLE OF HIGH SPEED CONTINUOUS PHOTOGRAPHY

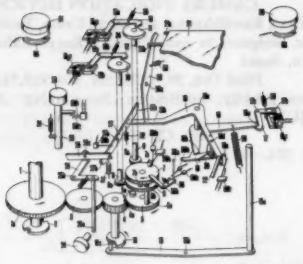
Nobuaki Date; Hiroshi Aizawa, both of Kawasaki; Masanori Uchidoi, Yokohama; Tomonori Iwashita, Fuchu, and Masami Shimizu, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1978, Ser. No. 906,629

Claims priority, application Japan, May 19, 1977, 52-57940

Int. Cl.[2] G03B *7/00, 9/08, 19/12, 17/42*

U.S. Cl. 354—60 R **2 Claims**



1. A single lens reflex camera on which an automatic winding up device can be mounted and which is capable of continuous photographing by repeating the diaphragm operation, the mirror operation, the shutter operation and the winding up operation in sequence by means of the release operation comprising:

a lens having a variable diaphragm;

a movable mirror;

a driving member for stopping-down the diaphragm to a predetermined value and for actuating the movable mirror;

charging means for energizing the driving member;

means for holding the driving member at its charging position;

release means for releasing the holding of the driving member in response to a pressure by a release button, said driving member operating the diaphragm and the mirror before the shutter operation and said member resuming the initial position after the shutter operation so as to bring the diaphragm and the mirror in the initial state;

mode change over means for changing over to an ordinary photographic mode where the diaphragm and the movable mirror operate for each photograph taken and a high speed continuous photographic mode where a continuous photographing is performed while maintaining the diaphragm in its stopped-down state and the mirror in its lifted-up state; and

prevention means to be displaced in operative engagement with the change over means so as to prevent the operation of the driving member from resuming.

4,182,558

CAMERA MOUNTING DEVICE FOR AN ENDOSCOPE

Kazumasa Matsuo, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1977, Ser. No. 861,408

Claims priority, application Japan, Dec. 25, 1976, 51-174314[U]

Int. Cl.[2] G03B *17/00, 29/00;* **E16D** *1/10*

U.S. Cl. 354—62 **4 Claims**

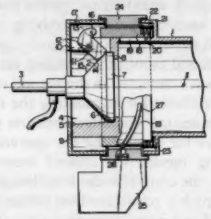
1. A camera mounting device for an endoscope comprising:

a connecting tube having one end fitted with a camera mount and the other end fitted with a conical ocular portion of an endoscope;

an adapting portion provided on said other end of the connecting tube and having formed therein a cavity for receiving the ocular portion and a peripheral wall; and

a connecting mechanism comprising

engaging elements pivoted at a pivotal point to said peripheral wall of the adapting portion for swinging in a plane including a central axis of the connecting tube, each of said engaging elements having an arcuate convex cam surface formed on that end of the respective engaging elements which is nearer the central axis, said cam surface



having a center of curvature separated from the pivotal point toward said one end of the connecting tube so that the cam surface is progressively separated from the pivotal point toward said one end of the connecting tube, and

urging means provided on the adapting portion for resiliently urging the engaging elements in a direction in which the arcuate convex cam surfaces of the engaging elements abut against the outer surface of the ocular portion.

4,182,559

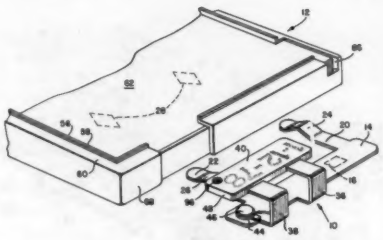
EXPOSURE IDENTIFICATION ACCESSORY

John J. Driscoll, Andover, and Nicholas Gold, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 3, 1978, Ser. No. 921,453

Int. Cl.[2] G03B *17/24*

U.S. Cl. 354—105 **18 Claims**



1. An accessory adapted to be detachably coupled to a film cassette for photographically recording indicia on a film unit located within the film cassette, said accessory comprising:

display means including a plurality of light emitting electroluminescent devices adapted to record indicia on a film unit located within the film cassette;

an electrical circuit including means for detecting a sudden voltage drop across a battery and means for engaging the terminals of the battery for providing current for said circuit;

means for electrically coupling said detecting means to said light emitting electroluminescent devices; and

means for detachably coupling said accessory to the film cassette prior to loading the film cassette into a camera such that said display means is located in position to be engaged by a film unit as it is moved into its exposure position, whereby when said accessory is coupled to the

film cassette and the film cassette is properly located within a camera with said engaging means in contact with the terminals of a battery used to power a component of the camera, said detecting means senses the drop in voltage across the battery upon energization of the component and momentarily directs a flow of current to said light emitting electroluminescent devices thereby illuminating said display means so as to photographically record the indicia on the film unit located in engagement with said display means.

4,182,560

COLOR PRINTING METHOD

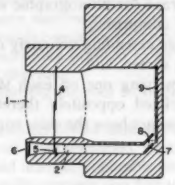
Masanobu Oguchi; Hidehiko Ishikawa; Haruyoski Okuyama, all of Nihonbashi-Muro; Yasuo Uchida, Hachioji, and Kiyoshi Izawa, Hino, all of Japan, assignors to Konishiroku Photo Industry Co. Ltd., Japan

Division of Ser. No. 701,018, Jun. 30, 1976, abandoned. This application Apr. 11, 1978, Ser. No. 895,441

Claims priority, application Japan, Jul. 23, 1975, 50-90479

Int. Cl.[2] G03B *17/24, 27/76, 27/32*

U.S. Cl. 354—106 **6 Claims**



1. A camera for taking photographs, comprising, means for holding a photosensitive color film having at least one frame for effecting a photographic exposure thereon and a record portion in the proximity of said frame to record brightness of the ambient light in the field of the exposure during the taking of the exposure, said record portion being measurable with respect to its color density and reproduced to be a neutral gray in printing a color positive print from said negative, light-transmitting means for transmitting ambient light from the field of exposure to said record portion, said camera having a shutter for effecting the taking of said exposure, said light-transmitting means comprises a light-guide to transmit the ambient light to record the brilliance, and light-adjusting means to vary the ambient light transmitted through said light-guide.

4,182,561

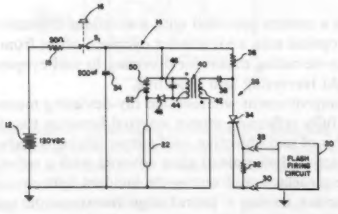
FAST CHARGING ELECTRONIC FLASH DEVICE

Edwin H. Land, Cambridge, and Conrad H. Biber, Needham, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 3, 1978, Ser. No. 930,863

Int. Cl.[2] G03B *15/03*

U.S. Cl. 354—145 **11 Claims**



11. An electronic flash unit of the type powered by a steady state voltage source for use with a camera of the type having a photographic cycle initiating switch manually actuable from a first to a second position and an exposure control system responsive to the manual actuation of the photographic cycle initiating switch from its first to its second position for initiating a photographic exposure interval at a minute time subsequent to the manual actuation of the switch, and for thereafter providing a flash firing trigger signal during the exposure interval, said flash unit comprising:

a housing;

a flash discharge tube; and

circuit means for receiving the steady state voltage supply and for connecting to the steady state voltage supply in order to store the steady state voltage in response to the manual actuation of the photographic cycle initiating switch from its first to its second position, said circuit means thereafter being charged by the steady state voltage supply to substantially the steady state voltage within the minute time between the manual actuation of the photographic cycle initiating switch and the actual commencement of the photographic exposure interval, said circuit means also including trigger circuit means responsive to the trigger signal for discharging said stored steady state voltage through said discharge tube to produce an illuminating flash of light.

4,182,562

AUTOMATIC WINDING UP DEVICE FOR A CAMERA

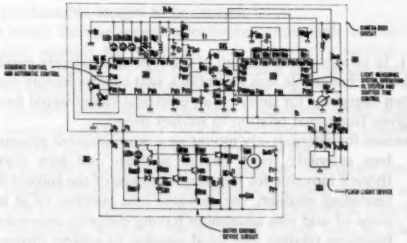
Tomonori Iwashita, Fuchu; Masanori Uchidoi, Yokohama; Toshikazu Ichiyanagi, Tokyo; Tetsuya Taguchi, Kawasaki; Yukio Iura, Yokosuka, and Hiroshi Aizawa, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 741,727, Nov. 15, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,862

Claims priority, application Japan, Nov. 17, 1975, 50-137987; Nov. 17, 1975, 50-137988

Int. Cl.[2] G03B *1/12, 9/64*

U.S. Cl. 354—173 **14 Claims**



1. An automatic winding up device for a camera comprising:

an electrical power source;

a winding up motor to be connected to the power source;

a winding up member to be driven by the winding up motor, said member for winding up a camera;

first switch means connected between the winding up motor and the power source, said means connecting the winding up motor to the power source at the first position and interrupting the connection of the winding up motor to the power source at the second position;

a terminal for receiving a winding up completion signal as well as an exposure completion signal from the camera body;

second switching means for detecting whether the signal received by the terminal is the winding up completion signal or the exposure completion signal;

delay means commencing operation when the second switch means detects the winding up completion signal so as to count a certain determined time; and

change over means for controlling the change over of the

first switch means from the first position to the second position or from the second position to the first position, said means bringing the first switch means in the first position when the second switch means detects the exposure completion signal and in the second position after the lapse of a certain time determined by the second switch means once the second switch means has dtected the winding up signal;

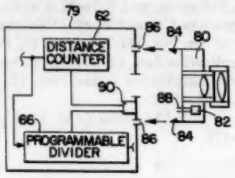
whereby the delay means overdrives the motor for a certain determined time after the winding up completion so as to exercise an overload on the winding up of the camera body by means of the winding up member and after the lapse of a certain determined time the motor is stopped, when the winding up member is driven along the reversed direction by means of a back pressure due to the overload on the winding up so as to release the camera body from the load.

4,182,563

FOCUS CONTROL SYSTEM FOR INTERCHANGEABLE ADJUSTABLE FOCUS LENSES

Conrad H. Biber, Needham; Edwin K. Shenk, Westford, and Shirley Y. Tam, Arlington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 20, 1978, Ser. No. 898,107
Int. Cl.[2] G03B *13/22*
U.S. Cl. 354—197 **20 Claims**



1. In an auto-focus camera of the type alternatively employing interchangeable lens assemblies, said camera having means when energized for deriving an electrical range signal having a given functional relation to subject distance,

means for alternatively mounting a multi-element adjustable lens assembly, each having at least one lens portion thereof movable for focusing an image of the subject on a recording medium, the movable lens portions of at least some of said lens assemblies having differing lens-subject functions relating lens focal position to subject distance;

drive means for adjusting the movable lens portion of a mounted lens assembly; and

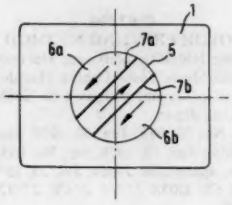
an electrical focus control circuit for controlling the operation of said drive means in accordance with said range signal and the lens-subject function of a mounted lens assembly to position the movable lens portion thereof at a focal position wherein the image of the subject is focused on said recording medium, said electrical focus control circuit including means for converting said range signal to a lens position parameter in accordance with said lens-subject function and for controlling said drive means to displace the movable lens portion of said mounted lens assembly to a position in accordance with said lens position parameter, the improvement wherein each said lens assembly carries an electrical circuit portion of said converting means to alter said resulting lens position parameter in accordance with the lens-subject function of said mounted lens assembly, and means for coupling said lens carried electrical circuit portion to said camera when each such interchangeable lens assembly is mounted thereon.

4,182,564

FOCUSING SCREEN FOR PHOTOGRAPHIC CAMERAS

Rolf Jurenz, and Horst Kodalle, both of Dresden, Fed. Rep. of Germany, assignors to VEB Pentacon Dresden Kamera und Kinowerke, Dresden, Fed. Rep. of Germany

Filed Aug. 1, 1978, Ser. No. 930,126
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1977, 2006730
Int. Cl.[2] G02B *5/04*; G03B *13/28*
U.S. Cl. 354—200 **3 Claims**



1. A focusing screen for photographic cameras with split-image range finder, comprising:

(a) a central wedge extending obliquely of the lateral edges of the focusing screen, and

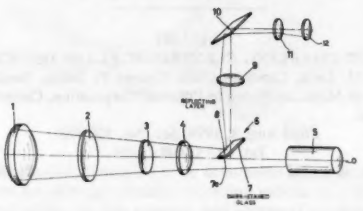
(b) lateral wedges lying one on each side of said central wedge and inclined oppositely thereto, the surface of which lateral wedges have the same angle of inclination as each other.

4,182,565

LIGHT-RAY DEVIATOR FOR CAMERA OBJECTIVE

Klaus Bauer, Bad Kreuznach, Fed. Rep. of Germany, assignor to Jos. Schneider & Co., Bad Kreuznach, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,161
Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722787
Int. Cl.[2] G02B *1/00, 1/10*; G03B *13/06*
U.S. Cl. 354—224 **3 Claims**



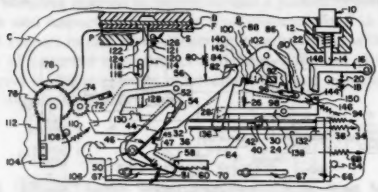
1. In a camera provided with a multilens objective centered on an optical axis, a viewfinder eyepiece offset from said axis, and ray-deviating means for diverting to said eyepiece part of the light traversing said objective,

the improvement wherein said ray-deviating means includes a fully reflecting mirror inserted between two lens members of said objective, said mirror having a body of nonreflective dark-stained glass covered with a reflective layer on a surface confronting the incident light rays, said body further having a lateral edge transverse to said surface positioned to intercept some of said light rays but prevented by the dark color of the body from reflecting the intercepted light rays.

4,182,566
SHUTTER RELEASE MECHANISM

James R. O'Reagan, Charlottesville, Va., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,562
Int. Cl.[2] G03B 17/38
U.S. Cl. 354—268 5 Claims



1. In a shutter release mechanism of the kind wherein a manually operable member is movable to initiate shutter actuation, a restraining member is movable from a restraining position for preventing shutter actuation to a releasing position for allowing shutter actuation, and a motion transmitting member is movable to transmit movement of said manually operable member to said restraining member for moving said restraining member from its restraining position to its releasing position, the improvement comprising:

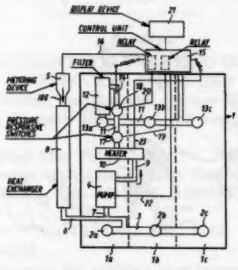
said motion transmitting member including a wedge-shaped portion; and

spring means connected to said motion transmitting member for moving said wedge-shaped portion into wedging contact with said manually operable and restraining members to substantially prevent any lost motion between the respective movements of the two members for shutter actuation.

4,182,567
APPARATUS FOR CONTINUOUSLY PROCESSING PHOTOGRAPHIC FILMS OR THE LIKE

Erwin Laar, Taufkirchen; Karl-Heinz Wagner, München, and Siegfried Krauss, Weilheim, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Jul. 17, 1978, Ser. No. 925,517
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2733030
Int. Cl.[2] G03D 13/00
U.S. Cl. 354—299 9 Claims

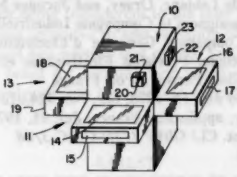


1. In a machine for processing photographic material, particularly for treating exposed photographic paper with a liquid developer, the combination of a liquid-containing vessel having at least one inlet and at least one outlet; conduit means connecting said outlet with said inlet; a pumping device installed in said conduit means to draw liquid from said outlet and to convey the withdrawn liquid to said inlet; a heating device installed in said conduit means between said pumping device and said inlet to maintain the temperature of the liquid within a given range; and means for controlling the operation of at least one of said devices as a function of the pressure of liquid in said conduit means, including means for monitoring the pressure of liquid in said conduit means, and means for deactivating said one device when the monitored pressure of liquid is outside of a predetermined range of pressures, said monitoring means comprising a first pressure responsive switch arranged to transmit a signal when the pressure in said conduit means drops to the lower limit of said predetermined range and a second pressure responsive switch arranged to transmit a signal when the pressure of liquid in said conduit means rises to the upper limit of said predetermined range.

4,182,568
MULTIPLEXED ELECTROSTATIC PHOTOCOPIER

Alfred B. Levine, 2924 Terrace Dr., Chevy Chase, Md. 20015

Filed Aug. 27, 1976, Ser. No. 718,260
Int. Cl.[2] G03G 15/28
U.S. Cl. 355—8 17 Claims



1. A randomly operable multiplexing electrostatic photocopier comprising:

a plurality of independently operable optical scanning stations, each adapted to randomly receive optically reproduceable images to be copied,

an image storage means selectively connectable to one of said stations for receiving and temporarily storing an image scanned by one of said stations and having means for reproducing said image at a later time,

a common electrostatic copying mechanism being selectively connectable for on-line operation to said scanning stations and off-line to said storage means,

and logically operated control means for selectively interconnecting any of said plurality of scanning stations and said storage means to said common electrostatic copying mechanism whereby images to be copied may be selectively applied on-line to said common electrostatic copy mechanism for reproduction from any of said scanning stations and off-line to said common electrostatic mechanism for reproduction from said storage means after a delayed time.

4,182,569
LITHOGRAPHIC DUAL LIGHT SOURCE APPARATUS

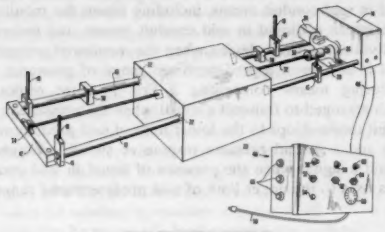
Terry L. Smith, Harrisburg, Pa., assignor to Dual Light Inc., Harrisburg, Pa.

Filed May 23, 1977, Ser. No. 799,332
Int. Cl.[2] G03B 27/10
U.S. Cl. 355—84 15 Claims

1. An apparatus for moving a light source into a desired position comprising:

(a) mounting means for mounting at least two light sources said light sources including at least one pinpoint light and at least one quartz light; and,

(b) means to move said mounting means into first and second positions such that in a first position one of said light



sources is in a desired position, and in a second position, another of said light sources is in a desired position.

4,182,570

DEVICE FOR MEASURING A COMPONENT OF WIND SPEED

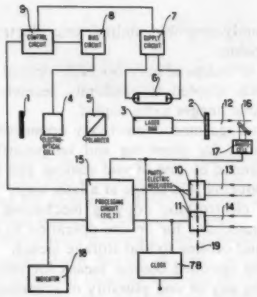
Gilbert Courrier, Juvisy sur Orge; Michel Duchet, Brüs sous Forges; Michele Leblanc, Orsay, and Jacques Moirez, Paris, all of France, assignors to Compagnie Industrielle des Lasers, Marcoussis; Compagnie Generale d'Electricite, Paris and "Societe d'Optique, Precision Electronique et Mecanique" Sopelem, Levallois Perret, all of, France

Filed Jul. 11, 1978, Ser. No. 924,013

Claims priority, application France, Jul. 21, 1977, 77 22355

Int. Cl.[2] G01P *3/36;* **G01C** *3/08*

U.S. Cl. 356—28 **6 Claims**



1. A device for measuring a component of wind speed, the device comprising:

a laser generator suitable for emitting a laser beam towards a target;

two photo-electric receivers disposed transversally with respect to the emission axis of the laser generator to receive a part of the energy of said beam; and

a circuit for processing the electrical signals delivered by the receivers to determine the slope at the origin of the normalized covariance function corresponding to these signals, the slope being representative of a weighted mean of the component of the speed of the wind blowing on the path of the laser beam in the direction of the straight line passing through the receivers;

wherein the laser generator includes means for emitting said beam in successive groups of two pulses, the pairs of pulses being separated by a predetermined time interval; and wherein

the receivers are so disposed in the proximity of said generator that each receives an echo of the laser pulses returned by the target.

4,182,571

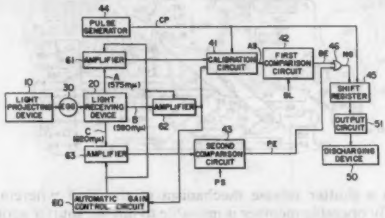
EGG INSPECTING APPARATUS

Naofumi Furuta, Kochino, and Hisatoshi Saito, Yokohama, both of Japan, assignors to Kewpie Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1978, Ser. No. 880,174

Int. Cl.[2] A01K *43/00;* **G01N** *33/08*

U.S. Cl. 356—53 **2 Claims**



1. An egg inspecting apparatus comprising: a light projecting means for projecting light to an egg to be inspected; a light receiving means in which light beams passed through said egg are converted into electrical signals in the wave length ranges of 575 mμ, 590 mμ and 620 mμ to output light reception signals, respectively; a calibration means for calibrating said light reception signal of 575 mμ on the basis of said light reception signal of 590 mμ to provide a calibration signal; a first comparison means for comparing said calibration signal with a predetermined blood containing egg level; and a second comparison means for comparing said light reception signal of 620 mμ with a predetermined addled egg level, thereby to obtain a defective egg signal from outputs of said first and second comparison means.

4,182,572

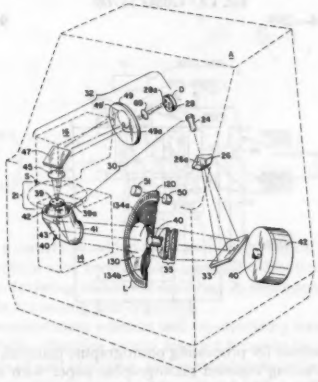
LENSMETER UTILIZING NON-PARALLEL LIGHT

William E. Humphrey, San Leandro, Calif., assignor to Humphrey Instruments Inc., San Leandro, Calif.

Filed Jul. 5, 1977, Ser. No. 813,646

Int. Cl.[2] G01B *9/00;* **G01D** *5/36*

U.S. Cl. 356—127 **20 Claims**



1. In combination, means for emanating light from a discrete light emitting area; a moving boundary locus including at least one boundary for occulting said discrete light emitting area; a sampling interval to which suspect optics may be placed for

deflecting light passing through said sampling interval; means for converging light from said light emitting area to a bundle of non-parallel light rays having a pupil located coincident with said suspect optics located in said sampling interval to which suspect optics may be placed for deflecting said light, said light diverging as deflected in a diverging bundle from said suspect optics at said sampling interval; a light path downstream from said sampling interval to receive at least a portion of said light from said suspect optics; and a photodetector fixed in space with respect to said downstream light path located within an area of expected excursion of said light from said sampling interval to detect changes of occultation of said light path by said moving boundary locus.

4,182,573

EXPOSURE METER

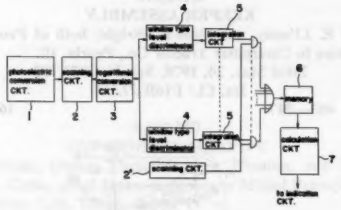
Seiji Yamada, Sakai; Ichiro Yoshiyama, Kobe, and Mashio Kitaura, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 15, 1977, Ser. No. 824,950

Claims priority, application Japan, Sep. 13, 1976, 51-110528

Int. Cl.[2] G03B 7/08; G01J 1/42

U.S. Cl. 356—218 **8 Claims**



1. An exposure meter for use in photography comprising:

a means for measuring the brightness of a scene to be photographed at a plurality of places;

a means for calculating the frequency distribution of brightness of said scene by dividing the measured brightness into a plurality of ranges and counting the number of said plurality of places having measured brightness within each of said plurality of brightness ranges; and

a means for calculating the exposure amount at which the film exposure latitude of a film to be used in the photography is in a predetermined relationship relative to said frequency distribution of brightness of said scene.

4,182,574

ARRANGEMENT FOR CARRYING OUT LASER SPECTRAL ANALYSIS

Winfried Quillfeldt, Jena-Lobeda, German Democratic Rep., assignor to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Filed May 13, 1977, Ser. No. 796,904

Claims priority, application German Democratic Rep., May 27, 1976, 1193041; Oct. 19, 1976, 1195334; Nov. 26, 1976, 1195979

Int. Cl.[2] G01J 3/30, 3/42

U.S. Cl. 356—318 **4 Claims**

1. An arrangement for enabling laser spectral analysis, comprising about an optical axis 0_1—0_1

a laser light source for emitting a beam of coherent light,

a first optical means for focusing said beam upon a target material to be analysed,

the energy conveyed by said beam being sufficient to evaporise said target material and to generate a material cloud expanding from the surface of said target material,

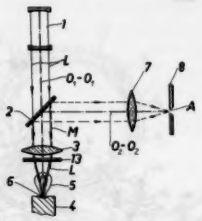
said laser beam simultaneously producing a focal spot in said target material surface, and heating said spot to incandescence to emit a radiation,

a second optical means including said first optical means,

a mirror and a lens system,

a spectrograph for analysing the absorption spectrum of said simple material,

said mirror being arranged in the path of the beam of coherent light between said laser light source and said optical focusing means, and being inclined relative to the light propagation direction of said coherent light,



said mirror being transparent to the laser light employed, and being reflective to said radiation emitted from said focal spot and passing said optical focusing means,

said lens being for focusing said radiation emitted from said focal spot into the aperture of said spectrograph.

4,182,575

APPARATUS FOR INSPECTING FLAT GLASS

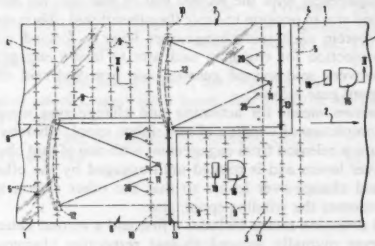
Donald G. Clark, Whitby, and Anthony Preston, Don Mills, both of Canada, assignors to Pilkington Glass Industries Limited, Scarborough, Canada

Filed May 17, 1978, Ser. No. 906,801

Claims priority, application Canada, May 26, 1977, 279202

Int. Cl.[2] G01N 21/16

U.S. Cl. 356—430 **6 Claims**



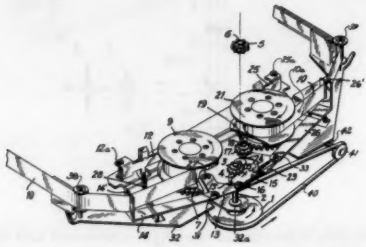
1. Apparatus for inspecting flat glass for defects, comprising:

a conveyor having a width sufficient to support the glass, two viewing stations disposed one on each side of the centre line of the conveyor and longitudinally displaced relative to each other along the direction of travel of the conveyor, the conveyor extending over only part of the conveyor width at each viewing station to provide an uninterrupted viewing area for viewing slightly more than one half of the glass width at each viewing station, and to provide support for part of the glass alongside each viewing area, a light source and a reflector at each viewing station, the reflector being positioned to reflect light from the source obliquely through said slightly more than one half of the width of the flat glass on the conveyor moving through the viewing area at that viewing station, and a viewing screen positioned to receive the reflected light after its passage through the glass.

4,182,576
INK-RIBBON REVERSING DEVICE

Kazuyoshi Fujimori, and Akio Mitsuishi, both of Shiojiri, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, Nagano, both of, Japan

Filed Jun. 23, 1977, Ser. No. 809,352
Claims priority, application Japan, Jun. 23, 1976, 51/74156
Int. Cl.[2] B41J *33/44*
U.S. Cl. 400—221 **8 Claims**



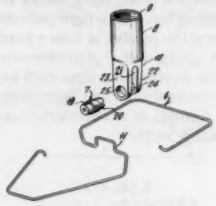
1. An ink-ribbon winding reversing device, comprising:
a first and a second ribbon spool shaft spaced apart from each other;
a first and a second ribbon spool rotatably mounted on said respective spool shafts;
gear means for transmitting power to said ribbon spools;
a drive shaft positioned between said spool shafts;
drive means for transmitting power to said drive shaft;
an arm rotatably mounted on said drive shaft;
a first gear fixed to said drive shaft;
a second gear rotatably mounted at one end of said arm in engagement with said first gear for transmitting power to said ribbon spool gear means;
actuable change-over means including a first change-over lever selectively engageable with the second end of said arm for holding said arm in position to drive one of said ribbon spools for winding until winding of said one spool is complete and a second change-over lever selectively engageable with the second end of said arm for holding said arm in position to drive the otherof said ribbon spools; wherein each said change-over lever is formed with a projection for engaging said arm to insure engagement between said second gear on said arm and said ribbon spool gear means;
detection means for actuating said change-over means at completion of winding of one ribbon spool, whereby said arm is released from engagement with one of said change-over levers and is rotated until engaged by the other of said change-over levers so that the other ribbon spool becomes the winding spool; and
said detection means includes a first and a second detection lever pivotally secured to said respective change-over levers, each detection lever being selectively displaceable away from said drive shaft whereby said arm is freed for rotation from engagement with one of said change-over levers.

4,182,577
MOP SWIVEL CONNECTOR

Michael F. O'Dwyer, Edgewood, Ky.; John J. Feroce, Marion, Mass., and David A. Jones, Dayton, Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed Jan. 5, 1978, Ser. No. 867,060
Int. Cl.[2] F16O *11/00*
U.S. Cl. 403—74 **7 Claims**

1. A swivel connector for attaching a handle to a body which comprises:
(a) a pivot member securable to the body;
a bifurcated pin member secured to the pivot member and rotatable through a first axis of rotation about the pivot member; and
(c) a socket member having an upper end portion adapted to receive the handle and a lower end portion secured to the

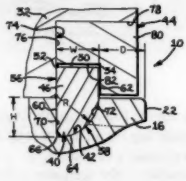


pin member, the socket member being rotatable through a second axis of rotation about the pin member, whereby the socket member is rotatable through any axis of rotation, including said first and second axes, about the pivot member.

4,182,578
KEEPER ASSEMBLY

Richard E. Livesay, and Paul L. Wright, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 24, 1978, Ser. No. 889,702
Int. Cl.[2] F16B *21/16*
U.S. Cl. 403—317 **16 Claims**



1. A keeper (**46**) for transferring a force from a first member (**32**) to a second member (**16**), said keeper (**46**) having a central axis (**18**), comprising:
a pair of oppositie end surfaces (**48**);
planar side surface means (**56**) for axially receiving the force from the first member (**32**), said planar side surface means (**56**) including a planar side surface (**60**) extending substantially between said end surfaces (**48**), said planar side surface (**60**) being located in a plane transverse said axis (**18**); and
curved side surface means (**58**) for transferring the force obliquely into the second member (**16**), said curved side surface means (**58**) including a convex side surface (**64**) facing away from said planar side surface (**56**), said convex side surface (**14**) being defined by a smoothly curved line revolved about said axis (**18**) substantially between said end surfaces (**48**).

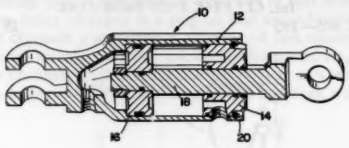
4,182,579
RETAINING RING

Harold E. McCormick, and Roger L. Berkbigler, both of Ballwin, Mo., assignors to Ramsey Corporation, Manchester, Mo.

Filed Dec. 23, 1977, Ser. No. 864,144
Int. Cl.[2] F16D *1/06*
U.S. Cl. 403—326 **19 Claims**

1. A retaining ring adapted to be located in a circumferential groove in a first member and engage a second member to restrain relative axial movement of said members in one direction, said retaining ring comprising a ring segment having an

L-shaped cross-section including a leg portion and a foot portion, the leg portion of said ring segment being for location in the groove of the first member and the foot portion of said ring segment having a surface for engaging with the first member near the groove, said leg having one surface for receiving a thrust load from one member and another surface for transmitting the thrust load to the other member, and said another surface having a circumferentially extending abutment surface portion for engaging a side surface defining the groove and a circumferentially extending recessed surface portion for confronting said side surface of said groove adjacent the foot portion for location in spaced relation to the edge of the groove.



4,182,580

UNDERDRAINAGE PIPE

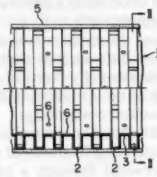
Shozo Hieda, Otake; Yoshio Uehara, Kashiwa, and Minoru Inaba, Chiba, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Mar. 17, 1978, Ser. No. 887,746

Claims priority, application Japan, Mar. 18, 1977, 52-32097[U]

Int. Cl.[2] E02B *13/00*; F16L *11/11*

U.S. Cl. 405—43 **4 Claims**



1. An underdrainage pipe which comprises:
(1) a liquid collecting pipe;
(2) protrusions disposed at an interval on the outer surface of the liquid collecting pipe, each protrusion being provided with at least one recess of which the bottom portion does not reach the outer surface of the liquid collecting pipe, the recesses on the adjacent protrusions being staggered in the longitudinal direction;
(3) a plurality of through-holes on the outer surface of the liquid collecting pipe and between the protrusions;
(4) a filter layer capable of substantially preventing entry of solid into the liquid collecting pipe, the filter layer being disposed around the liquid collecting pipe, and contacting the top portions of the protrusions; and
(5) a liquid conducting way composed of a space communicating both in the longitudinal direction and in the peripheral direction of the liquid collecting pipe and defined by the protrusions, the outer surface of the liquid collecting pipe and the inner surface of the filter layer.

4,182,581

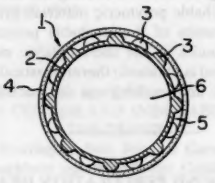
PIPE FOR UNDERDRAINING

Yoshio Uehara, Kashiwa; Minoru Inaba; Noriyuki Ishii, both of Chiba, and Yoshihisa Kusumi, Urawa, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Mar. 17, 1978, Ser. No. 887,608

Int. Cl.[2] E02B *13/00*; F16L *11/11*

U.S. Cl. 405—43 **8 Claims**



1. A pipe for underdrainage which comprises:
(1) a liquid collecting pipe;
(2) a plurality of discontinuous protrusions on the outer surface of the liquid collecting pipe;
(3) a plurality of through-holes on the outer surface of the liquid collecting pipe and between the discontinuous protrusions;
(4) a filter layer which permits the passage of liquids while substantially excluding solids, the filter layer being disposed around the liquid collecting pipe and contacting the top portions of the protrusions; and
(5) a liquid conducting way composed of a space communicating both in the longitudinal direction and in the peripheral direction of the liquid collecting pipe and defined by the protrusions, the outer surface of the liquid collecting pipe and the inner surface of the filter layer.

4,182,582

POROUS TUBES AND HOLLOW PROFILE STRUCTURES AND METHOD OF MAKING SAME

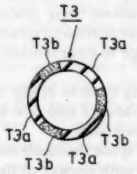
Anat Youval, Herzlia-on-Sea; Moshe A. Frommer, Rehovot; Shmuel Movshovich, Holon, and Adriana Cojocaro, Herzlia, all of Israel, assignors to A. T. Ramot Plastics Ltd., Tel Aviv, Israel

Filed Jan. 17, 1977, Ser. No. 759,751

Claims priority, application Israel, Jan. 27, 1976, 48917; Feb. 13, 1976, 49033

Int. Cl.[2] B29D *27/00*; A01G *25/06*

U.S. Cl. 405—45 **11 Claims**



1. A porous thermoplastic tube constituted of a plurality of wall sections in the form of longitudinally-extending strips of thermoplastic material each of a partially-circular uniform-thickness cross-section to define together a composite tube of circular cross-section and of uniform thickness, at least one of said wall-section strips being of a porous thermoplastic material which is continuously porous from the inner face to the outer face thereof to provide means for dispersing therethrough a fluid flowing internally of the tube; at least an other of said wall-section strips being of a non-porous thermoplastic material which is completely non-porous from the inner face to

the outer face thereof to provide mechanical strength to the tube.

6. A method of producing shaped microporous articles made from a thermoplastic matrix material and a leachable polymeric material, comprising: introducing the leachable polymeric material in the form of a powder into a mixer and mixing same at a temperature approaching the melting point of the powder to promote the adhesion of the powder particles to form sintered irregular crumbs; cooling the sintered irregular crumbs of the leachable polymeric material; grinding the sintered irregular crumbs of the leachable polymeric material together with granules of the thermoplastic matrix material until a uniform blend is obtained; thermoplastically shaping the so-produced blend; and leaching out the leachable polymeric material.

4,182,583

UNDERGROUND PERCOLATION HEAD AND WATERING SYSTEM

Ralph McEntyre, 957 N. E. 145th St., North Miami, Fla. 33161

Filed Aug. 14, 1978, Ser. No. 933,200

Int. Cl.[2] E02B *13/00*

U.S. Cl. 405—48 **6 Claims**

1. A percolation head for covering a hole in an irrigation pipe of circular cross section having an upper surface and side surfaces to be covered by earth and a bottom surface to rest on the earth in a shallow trough and in which the hole is one of a series provided in the upper surface, said head comprising:

(A) an elongated generally semi-circular member of a radius of curvature larger than the radius of curvature of said cylindrical pipe, said member having an inside main surface of a predetermined relatively large area sized to cover the upper and a portion of the side surfaces of the pipe and to extend longitudinally of the pipe a substantial distance on opposite sides of the hole, said inside surface having curved end edges and parallel side edges and having a pattern in relief on the inside surface, said pattern in relief comprising a plurality of spaced protrusions, each protrusion having a terminal end zone of relatively small area relative to said predetermined area of said inside main surface, said protrusions being spaced from one another and being of a common predetermined height, said pattern extending from edge to edge substantially over the inside surface,

(B) said member being sized to cradle the upper and a portion of the side surfaces of said pipe about said hole, with said protrusions comprising:

(a) spacer means to space the inside surface of the elongate member radially with respect to the pipe surface about the hole defining a water flow path, and

(b) baffle means extending between the pipe surface and the inside main surface of said elongate member about which water flowing in the path is constrained to be diverted in passing through the water flow path;

(C) the sum of the areas of the terminal end zones of said protrusions in engagement with the pipe being substantially less than the area of the inside surface of the elongate member;

(D) said waterflow path being relatively large and relatively unobstructed and through which water must flow in a curving path by reason of said baffling means thereacross.

4,182,584

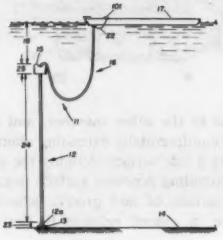
MARINE PRODUCTION RISER SYSTEM AND METHOD OF INSTALLING SAME

Narayana N. Panicker, Grand Prairie, Tex.; Fredric L. Hettinger, Ojai, and Darrell L. Jones, Ventura, both of Calif., assignors to Mobil Oil Corporation, New York City, N.Y.

Filed Jul. 10, 1978, Ser. No. 923,118

Int. Cl.[2] F16L *1/00*; B63B *35/00*

U.S. Cl. 405—195 **19 Claims**



1. A marine riser system comprising:

a lower rigid section comprising:

a casing of sufficient length to extend from the marine bottom to a point just below the water zone near the surface which is affected by surface conditions,

a connector assembly attached to the lower end of said casing,

guide means on said connector assembly adapted to cooperate with means on a base element preset on the marine bottom to properly position said lower rigid section on the base element,

remotely actuated connector means on said connector assembly adapted to cooperate with means on the preset base element to secure said lower rigid assembly to the base element,

at least one conduit within said casing and extending throughout the length thereof, said conduit having a remotely actuated connector on its lower end adapted to couple said conduit to a mating member within the preset base element, and

a buoy mounted on the upper end of said casing, said buoy having sufficient buoyancy to support said lower rigid section in a substantially vertical position when said rigid section is in an operable condition; and

an upper flexible section comprising:

at least one flexible flowline connected to said at least one conduit and extending in a curved path over said buoy and then downward through a catenary loop before extending upward to the surface, said flexible flowline being of sufficient length to maintain a catenary loop therein at all times during normal operating conditions.

4,182,585

DOUBLE-PLATE CONTROL DEVICE

Karl Krieger, Wuppertal, Fed. Rep. of Germany, assignor to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Oct. 6, 1978, Ser. No. 949,013

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1977, 2745631

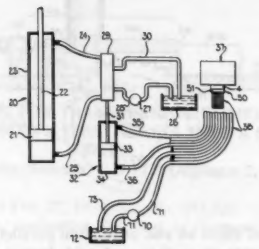
Int. Cl.[2] E21D *15/44*

U.S. Cl. 405—302 **8 Claims**

1. A control device for controlling hydraulically actuated equipment, the device comprising a fluid distributing block and a plurality of control valve units detachably mounted on the block, the block comprising a duct plate and a connecting plate, wherein:

(a) the duct plate comprises a first main face, a second main face, and bores extending through the duct plate to con-

nect said main faces, the said bores terminating on said first main face in a plurality of openings, namely, an inlet opening, an outlet opening, and a plurality of control line openings, which plurality of openings are for connection, in use of the control device, to fluid lines, channels extending on the said second main face, each said channel being connected to a corresponding one of the said plurality of openings on the first main face by way of said bores, the bores being arranged in a ring on said second main face, said channels comprising a plurality of first channels of various lengths radiating outwardly from said ring, said first channels each being connected by way of a said bore to a respective one of said control line openings, a second



channel communicating with said inlet opening, and a third channel communicating with the outlet opening, the second and third channels each being longer than any of said first channels;

(b) the connecting plate has a first main face abutting said duct plate to close said channels and thus define ducts, there being passages extending through said connecting plate, said passages opening on the first main face of the connecting plate at positions communicating each with a said duct; and

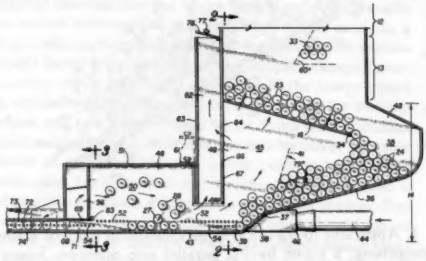
(c) the control valve units are detachably connected to said connecting plate and have valve passages in communication with the passages through the connecting plate.

4,182,586

AIR OPERATED CONVEYOR APPARATUS

Ronald A. Lenhart, Lakewood, Colo., assignor to Precision Metal Fabricators, Inc., Arvada, Colo.

Filed Jan. 13, 1978, Ser. No. 869,371
Int. Cl.² B65G *47/24, 53/06*
U.S. Cl. 406—87 **21 Claims**



1. An apparatus for receiving articles in random bulk and for discharging same serially in single file which comprises:

a pair of side walls held in spaced relation defining therebetween a bulk storage zone and an adjacent layout zone having a layout path with the side walls being spaced apart a distance slightly greater than the height of an article to be worked upon;

a plenum adapted to be connected to a source of air under pressure attached to either side wall in coextensive relation, with the plenum at its extremity exhausting into the layout zone in opposition to the direction of normal flow of articles therethrough;

a plurality of openings through the side walls communicating the plenums with the layout zone and positioned essentially parallel to the lower extremity of the side walls; and,

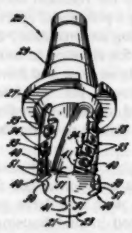
a chimney exhaust means essentially vertically positioned intermediate the bulk storage zone and the layout zone extending from just above the layout path to just above the bulk storage zone.

4,182,587

MILLING CUTTER AND INDEXABLE INSERT THEREFOR

Georg Striegl, Reutingen, Fed. Rep. of Germany, assignor to Ingersoll Maschinen und Werkzeuge GmbH, Burbach, Fed. Rep. of Germany

Filed Apr. 26, 1978, Ser. No. 900,263
Int. Cl.² B26D *1/12*
U.S. Cl. 407—113 **17 Claims**



1. A cutting insert comprising a block of cutting material having first and second quadrilateral and substantially flat face surfaces disposed in parallel planes, a first side of said first face surface being located at an acute included angle relative to a second and adjacent side of said first face surface and at an obtuse included angle relative to a third side of said first face surface, said first face surface having a fourth side substantially paralleling said first side, a first side of said second face surface being located at an acute included angle relative to a second and adjacent side of said second face surface and at an obtuse included angle relative to a third and adjacent side of said second face surface, said second face surface having a fourth side substantially paralleling the first side of said second face surface, a first edge surface extending between the first side of said first face surface and the third side of said second face surface, said first edge surface being inclined at an acute included angle relative to the first side of said first face surface and at an obtuse included angle relative to the third side of said second face surface, a second edge surface extending between the second side of said first face surface and the fourth side of said second face surface, said second edge surface being inclined at an acute included angle relative to the second side of said first face surface and at an obtuse included angle relative to the fourth side of said second face surface, a third edge surface extending between the third side of said first face surface and the first side of said second face surface, said third edge surface being inclined at an obtuse included angle relative to the third side of said first face surface and at an acute included angle relative to the first side of said second face surface, and a fourth edge surface extending between the fourth side of said first face surface and the second side of said second face surface, said fourth edge surface being inclined at an obtuse included angle relative to the fourth side of said first face surface and at an acute included angle relative to the second side of said second face surface.

4,182,588

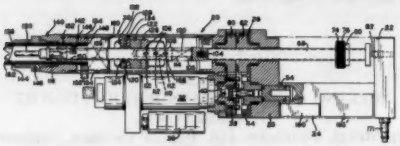
POSITIVE FEED DRILL

Robert C. Burkart, 5628 Sandra Lee Dr., Fort Wayne, Ind. 46800, and Gilbert J. Newbould, Blake Farm, North Littleton nr. Evesham, Worchestershire, England

Division of Ser. No. 730,424, Oct. 7, 1976, Pat. No. 4,111,590. This application Mar. 30, 1978, Ser. No. 891,893

Int. Cl.[2] B23B *47/04, 47/18*

U.S. Cl. 408—14 **4 Claims**



1. Drill apparatus comprising:

a housing having an elongated passage;

an elongated spindle having a polygonal cross-section and threaded on at least two apices of the polygon;

a drive gear mounted for rotation about a first axis in said passage and having a polygonal aperture centrally thereof for slidably receiving and rotatably driving said spindle;

a feed gear mounted for rotation in said passage and axially aligned with said drive gear and having a threaded aperture centrally thereof for threadedly receiving said threaded apices and imparting longitudinal movement to said spindle upon relative rotation thereto;

a motor;

a motor gear drivingly coupled to said motor for rotation about a second axis parallel to said first axis; said motor gear being in mesh with said drive gear;

a second gear mounted in said housing for rotation about said second axis and movable axially between a first position and a second position; said second gear being in mesh with said feed gear in said first and second positions;

locking means for rotationally locking said second gear to said motor gear when said second gear is in its first position and for unlocking said second gear from said motor gear and locking said second gear against rotation to said housing when said second gear is in its second position;

resilient means mounted in said housing for urging said second gear to said second position; piston means for selectively moving said second gear to said first position against the urging of said resilient means;

said piston means comprising a piston slidably and reciprocably mounted in said housing for movement along said second axis and engageable with said second gear for axial displacement of said second gear; and

means for preventing rotational movement of said piston about said second axis.

4,182,589

CORNER CHAMFERING MACHINE

Robert H. Boudreault, 17419 Farley Rd., Apt. 1, Los Gatos, Calif. 95030; Mark A. Boudreault, 837 Old Camden Ave., and Brenda L. Boudreault, 482 E Central Ave., both of Campbell, Calif. 95008

Filed Jul. 17, 1978, Ser. No. 924,987

Int. Cl.[2] B23C *1/025*

U.S. Cl. 409—138 **9 Claims**

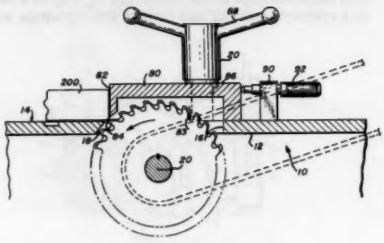
1. Chamfering apparatus for use in machining corner breaks of work pieces, comprising:

a base member establishing a horizontal support surface and a longitudinal slot extending through said horizontal support surface;

a guide block mounted on the base member substantially over said longitudinal slot and having a frontal vertical guide surface, the plane of said frontal vertical guide surface being substantially normal to the longitudinal axis of said slot, and at least a portion of said guide block being spaced from said horizontal support surface forming a trim slot about the intersection of the planes of the frontal vertical guide surface and the horizontal support surface;

adjustable positioning means coacting with said guide block for adjusting the vertical spacing between said frontal vertical guide surface and said horizontal support surface and the lateral position of said frontal vertical guide surface along the longitudinal axis of said slot;

a circular cutting member extending through said longitudinal slot and inside a slot provided in said guide block and,



mounted about an axis of rotation parallel with the horizontal support surface and said frontal vertical guide surface and with the peripheral cutting surface of said member extending within the trim slot; and

power means for driving the cutting member abouts its axis of rotation, whereby a work piece having adjoining walls substantially perpendicular to one another may be urged in abuttment with the frontal vertical guide surface and said horizontal support surface and moved laterally relative to the cutting member to remove material about the intersection of walls of said work piece to form a chamfer.

4,182,590

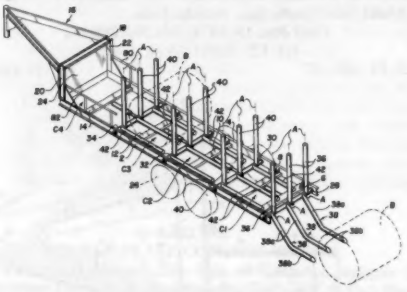
ARTICLE LOADING AND HANDLING DEVICE

Travis O. Harkness, Rt. 1, Box 95-A, Kaufman, Tex. 75142

Filed Aug. 22, 1977, Ser. No. 826,345

Int. Cl.[2] B65G *67/02*

U.S. Cl. 414—24.5 **2 Claims**



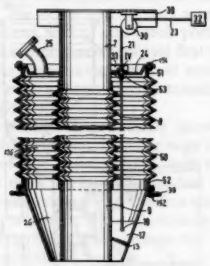
1. Apparatus to transport large cylindrical bales of material comprising: a frame having parallel side members joined in spaced relationship by connector members; a plurality of shafts rotatably supported between the side members in spaced relationship; two sets of fork arms disposed on one of said shafts adjacent one end of said frame, a first set of said fork arms being positioned substantially perpendicular to said shaft and the second set of fork arms having an angularly deflected portion secured to said shaft and a second portion secured to the end of the angularly deflected portion in a plane substantially perpendicular to the first set of fork arms such that when the first set of fork arms are vertical the second set of fork arms

are positioned such that the second portions of each fork arm are substantially parallel to the ground in position to pick up a bale of material; two sets of fork arms arranged in rows on each of the remaining shafts, said sets being substantially perpendicular to each other; a lug depending from each of said shafts; a plurality of hydraulic cylinders, each cylinder being operably connected to each shaft by said lug such that as each cylinder is fully extended one set of fork arms is in a substantially horizontal position and the other is in a substantially vertical position and when the cylinder is fully retracted the position of each set of fork arms is reversed in direction.

4,182,591
APPARATUS FOR TRANSFERRING FLOWABLE MATERIALS FROM A FIRST VESSEL INTO A SECOND VESSEL

Karl-Heinz Stanelle, Rosenstr. 4, D-7129 Güglingen 2, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,821
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2716640
Int. Cl.[2] B65G *67/06*
U.S. Cl. 414—291 **11 Claims**

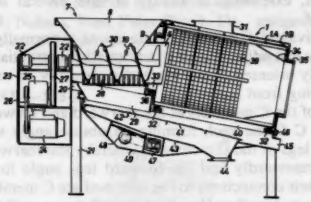


1. Apparatus for transferring flowable materials from an upper vessel into a lower vessel, comprising an upright duct including a rigid stationary upper section arranged to receive material from the upper vessel, a rigid lower section arranged to discharge material into the lower vessel, and a deformable median section intermediate said upper and lower sections; a funnel spacedly surrounding and rigid with said lower section so that said funnel and said lower section define a compartment for the entry of air which is expelled from the lower vessel during admission of material via said duct; means for moving said funnel and said lower section up or down with attendant deformation of said median section; an annular cover movable lengthwise of said duct between a first position in which it surrounds said lower section and overlies said funnel and a second position in which it surrounds said upper section; first fastener means for separably securing said cover to said funnel in said first position of said cover; second fastener means separably securing said cover to said first section in said second position of said cover; an elongated tubular bellows insertable between said cover and said funnel in said second position of said cover; third fastener means for separably securing said bellows to said cover in the second position of said cover; and fourth fastener means for separably securing said bellows to said funnel in said second position of said cover so that said bellows is deformable with said median section in response to movement of said lower section and said funnel relative to said upper section in said second position of said cover.

4,182,592
METHOD AND APPARATUS FOR HANDLING PALLETED LOADS COMPRISING BULK MATERIAL CONTAINED IN BAGS

Leif A. S. Henryson, Morarp, Sweden, assignor to AB Bergu Jarn- & Rorkonstruktioner, Helsingborg, Sweden

Filed Jun. 22, 1977, Ser. No. 808,756
Claims priority, application Sweden, Jun. 28, 1976, 76 07344
Int. Cl.[2] B65B *69/00*; B02C *18/06*
U.S. Cl. 414—412 **5 Claims**



1. An apparatus for handling palleted loads of bulk material contained in bags, comprising, in combination and in sequence,

(1) a downwardly tapering receiving hopper having an inlet opening at the top thereof receiving a plurality of bags of a pallet load dumped together into the hopper;

(2) a screw conveyor having a housing with a smooth inside face and a conveyor screw rotatably mounted therein, the conveyor screw having a sharp edge at least in the area of the lower opening of the hopper, and the lower end of the hopper being connected to and opening into the housing and feeding bags therefrom to the screw;

(3) cutting and tearing means on the conveyor screw projecting outwardly towards the smooth inside face of the housing, cutting through and opening bags received from said hopper with rotation of the screw;

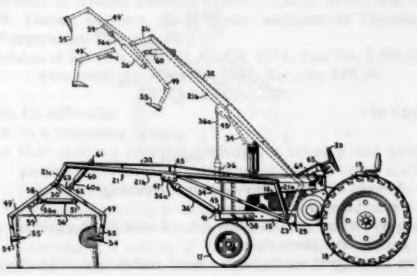
(4) grid means at the bottom of the housing of the screw conveyor allowing bulk material freed from the bags to be discharged from the housing, said smooth inside surface being formed by the innermost curved surfaces of said grid means with said innermost surfaces being slightly spaced from said conveyor screw; and

(5) a device for separating bag material from bulk material, the outlet end of the screw conveyor being operatively connected to the separating device and feeding bag material and bulk material axially to the separating device.

4,182,593
BALE LOADING AND HANDLING DEVICE

Walter A. Sweet, Rte. #1, Iantha, Mo. 64753

Filed Feb. 22, 1978, Ser. No. 880,181
Int. Cl.[2] B65G *47/90*
U.S. Cl. 414—732 **6 Claims**



3. Bale loading and handling means for use with a conven-

tional tractor having a tractor frame with a front and a rear end and sides thereto, front and rear sets of tractor wheels carrying said frame and a power source on said frame for driving the tractor, comprising, in combination:

a pair of elongate, C-shaped members in side elevation, with the C opening downwardly, positioned one on each side of said tractor frame, each said member pivotally mounted at one rear end thereof on one side of the lower portion of said tractor frame intermediate the front and rear ends of the tractor frame,

the other ends of the C members, as well as the lengths thereof, extending forwardly of said pivotal mounting thereof,

each individual C-member made up of a normally downwardly extending rear leg, a normally substantially horizontally oriented center leg and a normally downwardly extending front leg,

the legs of the C members at the rearward and forward ends of the C frame each forming an obtuse angle with the center legs of the C members, whereby the rearward legs angle rearwardly and the forward legs angle forwardly from their connections to the intermediate C member legs, thereby to lengthen the extension of the overall C members with respect to their pivotal mounting on the tractor frame,

the centers of the center legs of said C members positioned substantially forwardly of the front end of the tractor when the said C members are positioned with the center legs thereof substantially horizontal,

the front legs of the C members at the forward free ends thereof being shorter in length than the rear legs thereof which are pivotally connected to the tractor frame,

a plurality of transverse connecting members rigidly interconnecting the legs of said C members along the lengths thereof, whereby to interlock same into a rigid lift frame pivotable upwardly and downwardly around said rear end mountings,

hydraulic cylinder means pivotally connected at one lower end thereof to the lower portion of the front end of said tractor frame and at the other, upper end thereof to the lift frame adjacent the centers of the center legs of said C members for lifting and lowering the lift frame around the C member rear leg mountings thereof on the tractor frame, and

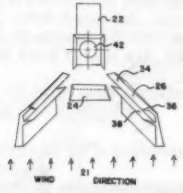
bale grasping, releasing and tilting means pivotally mounted on said lift frame at the free ends of the front legs of the C members thereof.

4,182,594

WIND DRIVEN ENERGY SYSTEM

George W. Harper, 11508 S. I St., Tacoma, Wash. 98444, and Walter E. Currah, Jr., 4401 S. 64th St., Tacoma, Wash. 98409

Filed Sep. 28, 1976, Ser. No. 727,347
Int. Cl.[2] F03D *1/04*
U.S. Cl. 415—2 **6 Claims**



1. A wind driven energy system comprising:

a wind chamber;

two apertures, one on each side of said wind chamber to permit flow there-through;

two fan-shaped windwheels placed within said wind chamber;

a venturi-shaped chamber placed within said wind chamber and opening on said apertures wherein said venturi shaped chamber expands in diameter after said first fan-shaped windwheel to a larger diameter when it meets said second fan-shaped windwheel;

a conical deflector which progressively widens as it approaches said first fan-shaped windwheel whereupon it decreases in diameter until it meets the second fan-shaped windwheel;

a series of baffles exterior to said wind chamber; and

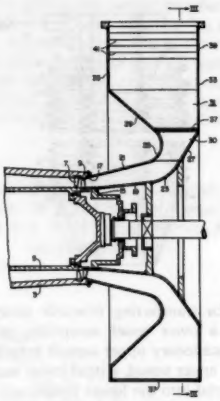
a means of producing electrical energy from said fan-shaped windwheels.

4,182,595

DISCHARGE ASSEMBLY FOR AN AXIAL FLOW COMPRESSOR

Ivan T. Burney, Plum Boro, Pa., and Tsoy K. Moy, Santa Clara, both of Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 30, 1978, Ser. No. 873,342
Int. Cl.[2] F04D *29/54*
U.S. Cl. 415—204 **3 Claims**



1. A discharge assembly for an axial flow compressor having a longitudinal axis and multiple circular arrays of stationary and rotatable blades disposed in series along said axes to compress a compressible fluid, said discharge assembly comprising:

a diffuser disposed directly downstream of the last circular array of rotatable blades, said diffuser having a first inner frustoconical wall portion and a first outer frustoconical portion disposed adjacent said last circular array of rotatable blades, an inner toroidal wall portion and an outer toroidal portion connected, respectively, to the first inner frustoconical wall portion and the first outer frustoconical wall portion, a second inner frustoconical wall portion and a second outer frustoconical wall portion connected, respectively, to the inner toroidal wall portion and the outer toroidal wall portion;

a scroll in fluid communication with said diffuser, and;

a discharge nozzle disposed in fluid communication with said scroll;

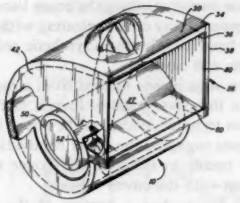
said diffuser and scroll cooperating to efficiently convert the swirling energy of the effluent fluid to pressure energy as the effluent fluid flows toward the discharge nozzle.

4,182,596

DISCHARGE HOUSING ASSEMBLY FOR A VANE AXIAL FAN

Donald C. Wellman, Marcellus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,193
Int. Cl.[2] F04D 29/54
U.S. Cl. 415—207 3 Claims



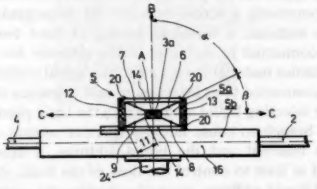
1. In a vane axial fan assembly, the improvement comprising:
a housing including a substantially spiral shaped scroll portion defining a chamber for receiving a fluid discharged from the blades of said vane axial fan;
a first member mounted within said chamber and extending longitudinally along the center line thereof with one end of said member being substantially adjacent to and of substantially equal diametrical width as the hub of said vane axial fan, the other end of said member being in contact with an end wall of said scroll portion, and with the longitudinal exterior surface of said first member being spaced from the inner surface of said scroll portion to define therebetween a longitudinally extending flow passage for the fluid; and
a substantially helically shaped baffle member mounted within said chamber having its outer edge contacting the inner surface of said scroll portion and its inner edge contacting the outer surface of said first member, said baffle member cooperating with said first member and said scroll portion to define a simultaneously radially and axially expanding fluid flow passage for the fluid discharged from said blades.

4,182,597

HELICOPTER ROTOR HEAD

Hans Derschmidt, Putzbrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 3, 1977, Ser. No. 838,677
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645174
Int. Cl.[2] B64C 27/38
U.S. Cl. 416—134 A 14 Claims



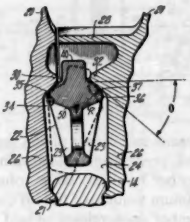
1. A rotor head having a rotational axis, for a hingeless rotor including rotor blades having a longitudinal axis and blade roots extending in said longitudinal axis of the rotor blades, flexible tethering means (6, 7, 8, 9), and a plurality of substantially rigid bars surrounding the longitudinal axis to form a securing box, said flexible tethering means connecting said substantially rigid bars and said rotor blades to the rotor head, said flexible tethering means comprising a number of flexible shear plates, and slot means in said blade roots, said flexible shear plates being inserted in said slot means, said flexible shear plates being arranged in such a manner that the planes defined by said flexible shear plates intersect each other in said longitudinal axis of said rotor blades.

4,182,598

TURBINE BLADE DAMPER

Charles J. Nelson, West Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 29, 1977, Ser. No. 828,457
Int. Cl.[2] F01D 5/10
U.S. Cl. 416—193 A 6 Claims



1. A turbine rotor comprising a turbine disk with turbine blade connector means; turbine blades with each blade attached to the turbine disk and having an airfoil, a platform, an extended neck section, and a root section, said platform being intermediate of the airfoil and the extended neck section, an axially extending blade rail located below the platform at the top of the extended neck section on each side thereof; means for fixing said turbine blades in said turbine disk; dampers, with each damper fitting into an opening formed by the adjacent extending neck sections of each pair of adjacent blades, the adjacent blade rails of adjacent blades and the turbine disk, said blade rails having axially extending downwardly facing flat surfaces at an angle to the centerline of each blade while the tops of the dampers have a curved surface on each side for contacting the surfaces of the blade rails during rotation of the rotor due to centrifugal loading on the dampers, a space is located between the adjacent ends of adjacent blade rails, each damper having a projection extending upwardly therefrom for extending between said blade rails, said projection being of such a width that during rotation of the rotor the bottom of the damper will be prevented from touching either of the adjacent extending neck sections of adjacent blades.

4,182,599

VOLUME-RATE RESPIRATOR SYSTEM AND METHOD

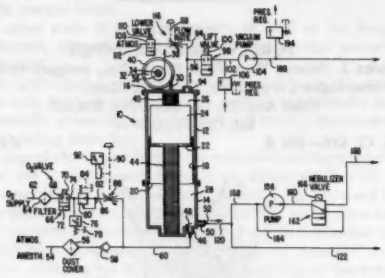
Theodore B. Eyrick, Reading; Allen C. Brown, Acton, and Neil R. Hattes, Danvers, all of Mass., assignors to Chemetron Corporation, Chicago, Ill.

Division of Ser. No. 402,677, Oct. 2, 1973, Pat. No. 3,905,362.
This application Jan. 29, 1975, Ser. No. 545,287
Int. Cl.[2] F04B 17/00
U.S. Cl. 417—328 24 Claims

1. In a respirator system,
a fluid delivery cylinder including a housing and gravity piston means dividing said housing into an upper control chamber and a lower delivery chamber;
means for producing a vacuum in said control chamber for lifting said piston means to expand said delivery chamber, comprising a source of vacuum and valve means selectively operable to connect said source of vacuum to said control chamber;
means for releasing said vacuum to lower said piston means,

said piston means operating solely under the influence of gravity to move downwardly to compress said delivery chamber;

control means for periodically and alternately energizing said vacuum producing means and said vacuum releasing means for drawing fluid into said delivery chamber and for discharging said fluid, said control means operating



said valve means to lift said piston means a variable but selectable and predeterminable distance to expand said delivery chamber to a selectable volume, whereby a selectable maximum volume of fluid is discharged from said delivery chamber upon release of said vacuum; and

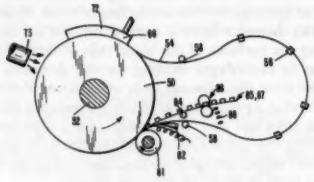
discharge means connected to said delivery chamber for receiving discharged fluid.

4,182,600

SLIDE FASTENING ELEMENT APPARATUS

George B. Moertel, Conneautville, Pa., assignor to Textron, Inc., Providence, R.I.

Division of Ser. No. 601,787, Aug. 4, 1975, Pat. No. 4,084,296.
This application May 27, 1977, Ser. No. 801,255
Int. Cl.[2] B28F *1/10*
U.S. Cl. 425—129 R **3 Claims**



1. An apparatus for forming a pair of trains of fastening elements comprising

a rotatable cavity wheel having a pair of spaced rows of fastening element forming cavities in the periphery of the cavity wheel;

said cavities each having a head forming portion, a pair of leg forming portions extending from opposite sides of the head forming portion, and a pair of heel forming portions in which the leg forming portions terminate;

said head forming portion, leg forming portions, and heel forming portions of each cavity extending in a straight line parallel the axis of the cavity wheel;

a row of runner channels in the periphery of the cavity wheel between the pair of rows of cavities wherein each of the runner channels communicates with one end of a respective cavity of the cavities in each of the pair of rows of cavities;

a cover band of stainless steel engaging the periphery of the cavity wheel over a predetermined arcuate portion between first and second angular positions of the cavity wheel for enclosing the fastening element forming cavities and the runner channels in the cavity wheel;

said band having a row of staggered openings communicating into the runner channels;

two pairs of annular grooves in the periphery of the cavity wheel intersecting at right angles the respective heel forming portions of the cavities for receiving and holding the respective pairs of supporting filaments for the trains of elements;

injection shoe means engaging the cover band and having an injection passageway communicating with the openings in the cover band for injecting a synthetic polymer resin into the runners and cavities;

said injection shoe means formed from a material which is softer than the cover band to form a sacrificial injection shoe means to reduce wear on the cover band;

pressure means engaging the cover band adjacent the injection shoe means to maintain the cover band tightly in engagement with the cavity wheel;

guide means for guiding a portion of the cover band in spaced relationship from the cavity outside of the predetermined arcuate portion;

means positioned after separation of the cover band from the cavity wheel for severing flash from the outside of the cover band;

means positioned after the severing means for separating the pair of trains of fastening elements and runners from the cover band; and

means positioned after the separating means for severing the runners from the pair of trains of fastening elements

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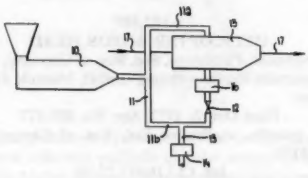
4,182,601

EXTRUSION APPARATUS

Alan H. Hill, Bury, England, assignor to The General Engineering Co. (Radcliffe) Limited, Bury, England

Filed Jun. 28, 1978, Ser. No. 919,904
Claims priority, application United Kingdom, Aug. 20, 1977, 35035/77
Int. Cl.[2] B29F *3/04, 3/10*
U.S. Cl. 425—97 **10 Claims**

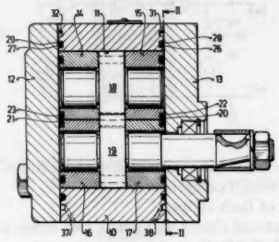


1. An apparatus for producing insulated electrical conductor wire comprising a screw extruder for homogenising a basic plastics material, a manifold having at least two branches, means connected to an outlet of the extruder for feeding the basic plastics material to said manifold, liquid additive injecting means connected to at least one of said branches of said manifold for injecting liquid additive into the basic plastics material in said branch to cause initial dispersive mixing of the basic plastics material and the liquid additive, a control device adapted at least to control the flow of the basic plastics material and liquid additive, means for feeding the mixture of basic plastics material and liquid additive to said control device, means for completely dispersing the liquid additive through the basic plastics material to produce a homogenous stream of modified plastics material, a conductor covering die and means for feeding the modified plastics material to said conductor covering die to produce a covered electrical conductor.

4,182,602
LEAKAGE PREVENTION MEANS FOR A POSITIVE DISPLACING MACHINE

Wilhelm Dworak, Stuttgart; Karl-Heinz Müller, Vaihingen, and Wolfgang Talmon, Ötisheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,382
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2600381
Int. Cl.² F04C *15/00*
U.S. Cl. 418—132 13 Claims

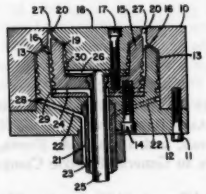


1. A positive displacement machine, comprising a housing element having an interior chamber provided with an open end; a cover element closing said open end of said interior chamber and immovably connected with said housing element; movable working members in said interior chamber and in operation producing high pressure in the same; sealing means including an annular groove formed in at least one of said elements and surrounding said open end of said interior chamber, and a sealing member located in said groove for sealing said interior chamber of said housing element, and a further unobstructed annular groove formed in at least one of said immovable elements radially outwardly of said first-mentioned groove at a distance and separate from the latter, said further annular groove communicating with an air space which is under a pressure lower than the pressure in said interior chamber of said housing element so that, during the operation of the machine only air moves inwardly and outwardly of said further annular groove but a working fluid cannot flow out of the machine past the latter.

4,182,603
MULTILAYER TUBULAR EXTRUSION DIE

Richard R. Knittel, Martinsville, N.J., assignor to Egan Machinery Company, Somerville, N.J.

Filed Mar. 27, 1978, Ser. No. 890,198
Int. Cl.² B29D *23/04*
U.S. Cl. 425—133.1 1 Claim



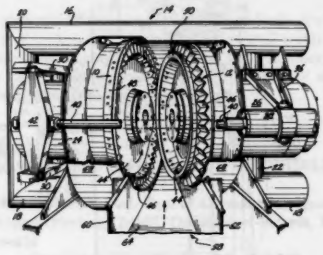
1. Extrusion die apparatus for coextruding thermoplastic material in the form of a tube by means of the blown film process comprising an annular die body, two or more spiral mandrels each having one or more helical grooves in its periphery concentrically mounted within the die body and forming annular passages between the body and one mandrel and between the mandrels, a source of molten thermoplastic material connected to each annular passage wherein the material is forced through the annular passages and extruded from the die in the form of a multilayered tube, the improvement comprising:

the helical groove or grooves of at least one spiral mandrel are of opposite hand than the helical groove or grooves of the remaining spiral mandrel or mandrels.

4,182,604
BLOCKING MACHINE

Wesley R. Wagner, Kent, Wash., assignor to Keith Manufacturing, Madras, Oreg.

Filed Feb. 13, 1978, Ser. No. 877,518
Int. Cl.² B29C *15/00*
U.S. Cl. 425—237 6 Claims



1. A mechanism for forming loose hay or the like into compact blocks, comprising:

a first presser wheel including a first ring of axially projecting presser teeth and an annular first wall located radially outwardly of the presser teeth and projecting axially beyond them;

a second presser wheel including a second ring of axially projecting presser teeth and an annular second wall located radially inwardly of the presser teeth and projecting axially beyond them;

first mounting means mounting said first presser wheel for rotation about a first axis;

second mounting means mounting said second presser wheel for rotation about a second axis which intersects the first axis to provide a compressing set of presser teeth;

means to drive both the first and second presser wheels;

wherein the first and second presser wheels are obliquely related and come relatively together at a side location wherein the first and second wall ring and presser teeth form pockets, and wherein at such side location the first wall is located radially outwardly of each set of presser teeth and forms an outer radial boundary for the pockets, the second wall is located radially inwardly of both sets of presser teeth and forms an inner radial boundary for the pockets, and the presser teeth on the two presser wheels come together in a meshing compressing relationship in pairs to define the remaining boundaries of the pockets; and

means for feeding loose hay or the like into the space between the two rings of teeth ahead of where the teeth meet in pairs to form the pockets.

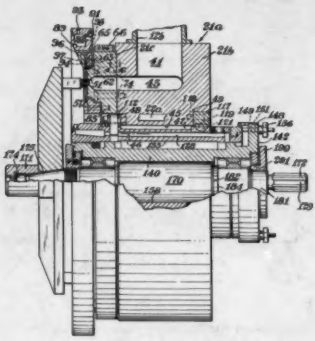
4,182,605
DIE FACE CUTTER

Edward V. Dettmer, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 17, 1978, Ser. No. 896,647
Int. Cl.² B29C *17/16*
U.S. Cl. 425—311 7 Claims

1. A die face cutter assembly, the die face cutter assembly comprising in cooperative combination a generally annular

extrusion die having an extrusion face of generally annular planar configuration, the die having a die body and a generally annular plenum therein having an axis of generation, the die body defining an entrance passageway, the entrance passageway being in communication with the plenum, the die body defining a plurality of extrusion passages in communication with the plenum, the extrusion passages extending generally perpendicular to the die face and each passage having a nozzle protruding therefrom, the nozzles each defining an extrusion nozzle passage therein in communication with the extrusion passages the nozzles being generally circularly arranged, a cutting plate having generally annular configuration and at least one generally planar cutting face, the cutting plate defining a plurality of passages therethrough, the passages each



corresponding to a location of the nozzles, the die body on the die face defining a first or outer land and a second or inner land having the nozzles disposed therebetween, the lands being annular in configuration and generally coplanar, the cutting plate being supported on the lands, a first clamp ring disposed external to the first land, the first clamp ring affixed to the die body forcing the cutting plate against the first land, a second clamp ring disposed within the first land, the second clamp ring being affixed to the die body, the second clamp ring forcing the cutting plate into engagement with the second land, the face of the cutting plate being generally coplanar with ends of the nozzles supported in the die body, a cutter rotatably supported generally on said axis adapted to work against the cutting plate.

4,182,606

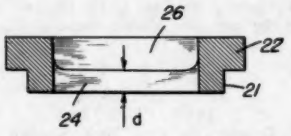
SLIT EXTRUSION DIE

John D. Gibbon, Charlotte, N.C., assignor to Fiber Industries, Inc., New York, N.Y.

Division of Ser. No. 633,758, Nov. 20, 1975, Pat. No. 4,123,490. This application Jun. 14, 1978, Ser. No. 915,430

Int. Cl.[2] B29C *17/04*; B29D *7/24*; B29C *23/00*

U.S. Cl. 425—461 **4 Claims**



1. A die for overcoming draw resonance in extruded tapes at high melt draw down ratios comprising a slit die having an entry port which is greater in depth (d) at both ends than at the center by an amount equal to 0.1 to 0.4 times said slit's length.

4,182,607

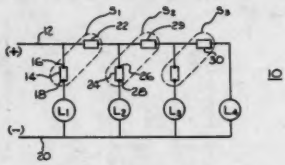
PHOTOFLASH LAMP UNIT UTILIZING RADIATION AND VOLTAGE RESPONSIVE SWITCH DEVICES

Edward J. Collins, Mentor-on-the-Lake, and Vaughn C. Sterling, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 1, 1977, Ser. No. 856,273

Int. Cl.[2] F21K *5/02*

U.S. Cl. 431—359 **21 Claims**



1. A photoflash lamp unit for sequential firing of associated flash lamps which comprises:

(a) a pair of flash lamps,

(b) an electrical circuit into which said lamps are connected to fire individually and in sequence, and

(c) a combination radiation and voltage responsive switch device located external of the lamps and forming part of the electrical circuit, said switching device being in the form of a material admixture which undergoes both thermochemical decomposition upon radiant energy exposure and undergoes dielectric breakdown from a high resistance condition to a low resistance condition when a high voltage pulse is applied, said switch device being located adjacent one of said lamps and disposed to receive direct radiant energy emitted by that lamp at only a first region, said direct radiant energy being transmitted through cooperative aperture means spaced between said adjacent flash lamp and said switching device, whereupon said first region undergoes thermochemical decomposition sufficient to interrupt the circuit path to the radiation actuating lamp while a second region of said switch device not directly receiving radiant energy through said cooperative aperture means remains connected in the electrical circuit to the unflashed lamp.

4,182,608

PHOTOFLASH LAMP UNIT UTILIZING RADIATION AND VOLTAGE RESPONSIVE SWITCH DEVICES

Harihar D. Chevali, and Thomas A. Evans, both of Mentor, Ohio, assignors to General Electric Company, Schenectady, N.Y.

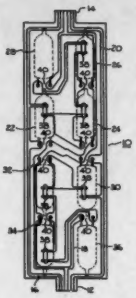
Filed Dec. 1, 1977, Ser. No. 856,274

Int. Cl.[2] F21K *5/02*

U.S. Cl. 431—359 **15 Claims**

1. A radiation switch for a flash lamp unit which can covert from a high electrical resistance to a low electrical resistance when exposed to the radiation being emitted from a flash lamp disposed adjacent to the switch, said switch comprising an admixture of a metallic silver source with a sufficient amount

of a metal containing material selected from the group consisting of titanium metal and titanium hydride to convert the



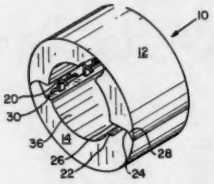
switch to a low electrical resistance path upon application of a high voltage pulse when said adjacent flash lamp fails to flash.

4,182,609

PROTECTIVE REFRACTORY MEMBER

James E. Hovis; Harry P. Finke, both of Pittsburgh, and Hans E. Leumann, Washington, all of Pa., assignors to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed Mar. 17, 1978, Ser. No. 887,600
Int. Cl.[2] F27D *1.12*
U.S. Cl. 432—234 13 Claims



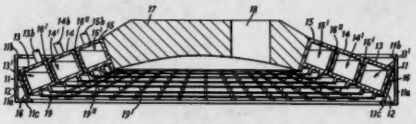
1. In a protective refractory insulation system for protecting heat absorptive elongated elements in a high temperature heat treating furnace and having at least two parts with mating parallel longitudinal edges adapted to be connected to form an elongated member for positioning about said element, each part including an interconnected reticulated metal structure solidly embedded therewithin substantially adjacent an interior surface thereof, the improvement comprising means to connect said parts to each other about said elements, said means being substantially adjacent said interior surface and including hook receptive means associated with the reticulated metal structure and extending out of certain of said mating edges and clip means connected to said reticulated metal structure at other of said mating edges, said clip means being partially embedded in said part and having at least one hook extending outward from said mating edges so as to be attachable to said hook receptive means to interconnect and maintain said parts in assembled relationship.

4,182,610

WATER-COOLED FURNACE COVER

Susumu Mizuno, Nagoya, and Hiroshi Imagawa, Tajimi, both of Japan, assignors to Daidotokushuko Kabushikikaisha, Japan

Filed Feb. 8, 1978, Ser. No. 876,072
Claims priority, application Japan, Feb. 8, 1977, 52-12856; Feb. 8, 1977, 52-12857
Int. Cl.[2] F27D *1/12*
U.S. Cl. 432—237 5 Claims



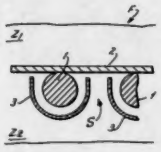
1. A water-cooled furnace cover having a body portion with a plurality of jackets each including an internal water channel, said jackets being arranged side by side, and a number of fins in the form of a lattice extending from a surface of said body portion facing the interior of the furnace.

4,182,611

ROLLER-HEARTH FURNACE WITH SHIELDED ROLLERS

Rudiger Knaak, Neuss, Fed. Rep. of Germany, assignor to Koppers-Wistra-Ofenbau GmbH, Duesseldorf-Heerdt, Fed. Rep. of Germany

Filed Mar. 24, 1978, Ser. No. 890,709
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713139
Int. Cl.[2] F27D *3/00*
U.S. Cl. 432—245 10 Claims



1. In a roller-hearth furnace having a furnace chamber for high-temperature use, a combination comprising a plurality of axially parallel rollers exposed to heating from above and below and adapted to support workpieces thereon whereby the rollers are shielded against heating from above in the presence of such workpieces; and means for shielding each of said rollers laterally and from below against direct exposure to the heated atmosphere in the furnace while permitting access of the heated atmosphere from below between adjacent rollers to the workpieces supported thereon, so as to permit heating from below of the supported workpieces while preventing heating of successive roller-surface increments to a temperature which is so much higher than the workpiece temperature as to cause premature deterioration of the roller material due to alternating heating and cooling of the roller-surface increments.

4,182,612
METHOD FOR DYEING HUMAN HAIR WITH CATIONIC POLYMERIC DYES

Phillip E. Sokol, Rockville, Md., and Hu-Chu Tsai, Hingham, Mass., assignors to The Gillette Company, Boston, Mass.

Filed Jan. 31, 1977, Ser. No. 763,850
Int. Cl.[2] A61K *7/13*
U.S. Cl. 8—10.1 **7 Claims**

1. A method of dyeing human hair which comprises applying to said hair an effective amount of a composition comprising an aqueous medium containing up to 5.0% by weight of a cationic polymeric dye comprising the reaction product of a dye and a cationic polymer selected from the group consisting of polyethylenimine having a molecular weight of 300 to 200,000, polydiallylamine having a molecular weight of 10,000 to 2,000,000, and the reaction products obtained by the condensation of alkylene polyamines having 3 or more primary, secondary or tertiary amino groups separated by alkylene groups having 2 to 5 carbon atoms and having a molecular weight of 60 to 400 with difunctional compounds selected from the class consisting of dibasic acids having 2 to 54 carbon atoms, alpha-omega aliphatic dihalides having 2 to 10 carbon atoms, epihalohydrins and diepoxides having 4 to 18 carbon atoms, said reaction products having a molecular weight of 1,000 to 100,000, said polymer having condensed on a portion up to 25% of the primary and secondary amino groups thereof, a dye selected from the group consisting of azo, anthraquinone, nitro, nitroso, stilbene, diphenylmethane, triarylmethane, xanthene, acridene, quinoline, methine, thiazole, indamine, indophenol, azine, thiazine, lactone, aminoketone, hydroxyketone, indigoid and phthalocyanine.

4,182,613
COMPATIBILITY ADDITIVE FOR FUEL OIL BLENDS

William H. Stover, Sombra, and Samuel A. Hunter, Bright's Grove, both of Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 24, 1976, Ser. No. 744,639
Int. Cl.[2] C10L *1/32*
U.S. Cl. 44—51 **7 Claims**

1. A petroleum composition having a kinematic viscosity ranging from about 40 Saybolt Seconds Universal (SSU) at 38° C. to about 300 Saybolt Seconds Furol (SSF) at 50° C. comprising about 5 to 100 wt.% of residuum, said composition containing dispersed sedimentary asphaltic constituents, said fuel being a blend of fuels which tend to be incompatible whereby the blend tends to separate said asphaltic constituents as sediment in the Sediment by Hot Filtration (SHF) test, and a minor but sediment-stabilizing proportion of an alkylarylsulfonic acid which inhibits said sedimentation and having in the range of 10 to 70 total carbons.

4,182,614
SURFACE ACTIVE AGENT FOR EMULSION FUEL

Noboru Moriyama; Yoshio Aoki, both of Wakayama, and Yukihiro Furuyama, Naga, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1978, Ser. No. 912,924
Claims priority, application Japan, Jun. 14, 1977, 52-70093
Int. Cl.[2] C10L *1/32*
U.S. Cl. 44—51 **6 Claims**

1. In a method for preparing a water-in-oil emulsion fuel which comprises emulsifying water in oil, in the presence of an emulsifying agent, the improvement which comprises using, as the emulsifying agent, surfactant having the formula:

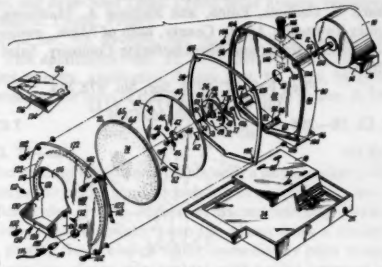
$$\begin{array}{l} CH_2O(C_2H_4O)_{n1}X \\ | \\ CHO(C_2H_4O)_{n2}X \\ | \\ CH_2O(C_2H_4O)_{n3}X \end{array}$$

wherein at least 1.25 on the average of the three X's are lauroyl or oleoyl and the remaining X's are hydrogen, and the sum of the numbers n1, n2 and n3 is in the range of from 2 to 50.

4,182,615
DENTAL MODEL TRIMMER

Bernard Weissman, New York, N.Y., assignor to Ipco Hospital Supply Corporation, White Plains, N.Y.

Filed Jan. 5, 1978, Ser. No. 867,166
Int. Cl.[2] B24B *9/00*
U.S. Cl. 51—125 **22 Claims**



1. A dental model trimmer comprising:

a housing including a main housing member having a rear wall and a perimetric side wall extending therefrom, with an aperture provided in said rear wall, and a cover plate releasably coupled to said main housing member;

sealing means interposed between said main housing member and said cover plate for providing a water tight arrangement therebetween, said sealing means including a sealing gasket, said perimetric side wall further including a recessed lip for receiving said sealing gasket thereagainst;

fastening means for releasably coupling said cover plate to said main housing member, said fastening means including spring loaded quarter turn fasteners extending through a front surface of said cover plate and into receptacles provided in said recessed lip of said perimetric side wall so that resilient pressure is applied to said sealing gasket providing said water tight arrangement;

a drive motor having an output shaft extending through said aperture and into said housing;

a backing plate assembly within said housing and coupled to said output shaft for rotation therewith;

an abrasive surfaced member in said housing between said cover plate and said backing plate assembly, said abrasive surfaced member being spaced from said output shaft;

releasable coupling means for coupling said backing plate assembly to said abrasive surfaced member for rotation therewith, said releasable coupling means including a plurality of apertures in said backing plate assembly and a correspondingly plurality of complementary bosses on said abrasive surfaced member, said apertures and bosses being respectively spaced apart circumferentially about a common rotational axis of said backing assembly and said abrasive surfaced member, said bosses and apertures matingly engaging and interlocking to rigidly retain said abrasive surfaced member against said backing plate assembly;

an access opening provided in said cover plate to expose a portion of an abrasive surface of said abrasive member to a dental model workpiece;

boundary means provided around said access opening for permitting angular manipulation of the workpiece and better visibility of the workpiece, said boundary means including a bounding surface beveled in a direction of said abrasive surfaced member and an inwardly projecting rim extending from said bounding surface into proximate relationship with said abrasive surfaced member; and

a tilting work table connected to said cover plate adjacent to said access opening on which the workpiece can be placed;

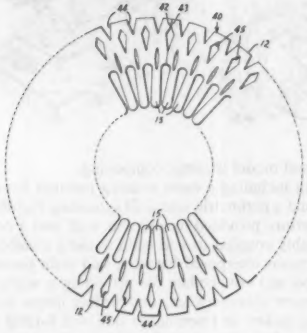
whereby the spacing of said abrasive surfaced member from said output shaft permits said abrasive surfaced member to be positioned closer to said access opening in said cover plate for better control of the workpiece while working thereon.

4,182,616

METHOD OF MAKING A ROTATABLE FLOOR TREATING PAD

Richard T. Gadbois, Edina, and Richard A. Matthews, Lino Lakes Township, Anoka County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 17, 1978, Ser. No. 878,703
Int. Cl.[2] B24D *11/02, 3/32*
U.S. Cl. 51—295 **7 Claims**



1. A method of making a flat annular pad suitable for use as a pad for a floor treating machine of the type which employs a rotatable pad comprising:

(1) uniformly modifying an elongate strip of conformable low-density abrasive product having flat faces on either side thereof and being at least about 3 inches wide and being at least ¼ inch thick to provide throughout its length at least one of

(a) an expandable zone at least adjacent one side which will not permit buckling of said strip when it is formed into a flat annular shape with the expandable zone directed outward, said expandable zone optionally being provided in part by a pattern of uniformly spaced slits which extend into said strip from said one side a distance up to 35% of the width of the strip; or

(b) a contractable zone at least adjacent the other side which will not permit buckling of said strip when it is formed into a flat annular shape with the contractable zone directed inward; and

(2) forming said strip into a flat annular shape with the expandable zone directed outward or the contractable zone directed inward to provide an annulus having at least one flat floor-contacting surface derived from one of the flat faces of said strip.

4,182,617

APPARATUS FOR THE WET SEPARATION OF FOREIGN PARTICLES FROM AIR

Mohamed A. Al-Saidi, c/o Embassy of the Yemen Arab Republic, 600 New Hampshire, NW., Washington, D.C. 20037

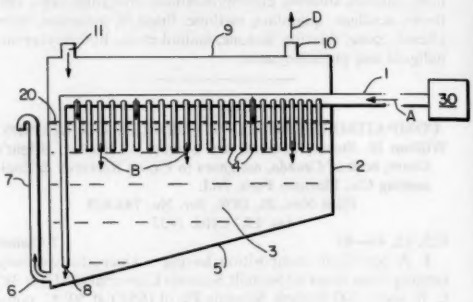
Filed Jul. 14, 1978, Ser. No. 924,828
Claims priority, application German Democratic Rep., Mar. 15, 1978, 204188
Int. Cl.[2] B01D *47/02*
U.S. Cl. 55—256 **7 Claims**

1. An apparatus for the wet separation of sand from contaminated air having suspended therein sand particles, said apparatus comprising:

a closed elongated vessel having opposite first and second ends and a longitudinal dimension extending substantially horizontally between said ends, said vessel containing therein a predetermined level of liquid;

air supply means for supplying contaminated air having suspended therein sand particles into said vessel, said air supply means comprising an elongated supply duct extending into said vessel through one of said ends thereof and extending through the interior of said vessel, in a direction parallel to said longitudinal dimension of said vessel, and at a position above said predetermined level;

air injection means for supplying said contaminated air from said supply duct into said liquid at plural positions below said predetermined level, whereby said liquid removes said sand particles from said air to form purified air which rises through said liquid, and the thus removed sand particles fall to the bottom of said vessel, said air injection means comprising a plurality of air pipes having first ends connected to said supply duct and second ends terminating at said positions below said predetermined level, said second ends of said air pipes opening and being directed vertically downwardly, said second ends of said air pipes being arranged and positioned uniformly throughout the horizontal cross-section of said vessel;



air outlet means for discharging said purified air from said vessel at a position above said predetermined level;

said bottom of said vessel being trough-shaped and having a sufficient downward inclination in said longitudinal direction from said first end to said second end of said vessel such that said sand particles slide downwardly along said bottom toward the bottom center of said second end of said vessel;

liquid outlet means, located at said bottom center of said second end of said vessel, for removing from said vessel liquid having entrained therein said sand particles;

at least one of said air pipes extending downwardly into said liquid further than the remainder of said air pipes, said second end of said at least one air pipe being positioned closely adjacent said liquid outlet means, such that air emitted from said second end of said at least one air pipe agitates said sand particles sufficiently to prevent said sand particles from clogging said liquid outlet means;

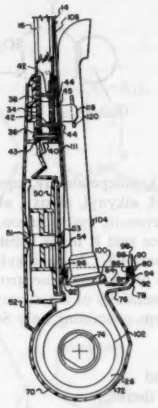
an overflow pipe having a first end connected to said liquid outlet means and a second end positioned at said predetermined level, such that liquid and sand particles entrained therein will flow out of said vessel through said liquid outlet means and said overflow pipe whenever the level of said liquid within said vessel exceeds said predetermined level; and

liquid supply means for supplying fresh liquid into said vessel, and whereby liquid having sand particles entrained therein is removed from said vessel through said liquid outlet means and said overflow pipe.

4,182,618
FASTENING ARRANGEMENT FOR UPPER FILL TUBE ON A SOFT BAG CLEANER

Donald B. Tschudy, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Apr. 18, 1978, Ser. No. 897,445
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—374 **5 Claims**

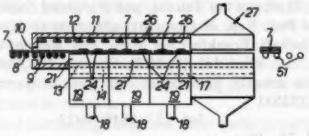


1. In a floor care appliance having an upper portion including an upstanding handle and rigid housing,
(a) said rigid housing being disposed at the lower part of said upper portion and at its bottom having an enlarged portion sized to contain a motor-fan unit for creating air movement through said floor care appliance,
(b) a soft, porous bag attached at its bottom to a lower portion of said rigid housing above said motor-fan unit and communicating with said motor-fan unit and forming a dirt-receiving cavity and extending upwardly above said rigid housing,
(c) a mounting plate attached to said rigid housing adjacent its upper termination,
(d) said soft, porous bag extending between said rigid housing and said mounting plate and being attached to said rigid housing by said mounting plate to surround the mounting plate and to lie against the contiguous side of said rigid housing, and
(e) said handle serving as means for grasping by an operator and attached to said rigid housing and extending upwardly therefrom.

4,182,619
METHOD OF TOUGHENING GLASS SHEETS

Geoffrey Greenhalgh, Orrell, Near Wigan, England, assignor to Triplex Safety Glass Company Limited, Birmingham, United Kingdom

Filed Jun. 19, 1978, Ser. No. 916,555
Claims priority, application United Kingdom, Jun. 23, 1977, 26362/77
Int. Cl.[2] C03B *27/00*
U.S. Cl. 65—114 **6 Claims**



1. A method of toughening a glass sheet comprising advancing the glass sheet through a quenching station where the sheet is subjected to at least one localised gas flow and pulsing that gas flow at a repetition frequency related to the speed of advance of the glass through the quenching station to induce in the glass a distribution of regions of more highly toughened glass interspersed with regions of lesser toughened glass.

4,182,620
SOLID PESTICIDE COMPOSITIONS

Claude Denninger, Chazay d'Azergues; Michel Joly, Villeurbanne, and Jean-Nöel Tabet, Lyons, all of France, assignors to Sogemaric, Lyons, France

Division of Ser. No. 594,856, Jul. 10, 1975, Pat. No. 4,093,440.
This application Nov. 21, 1977, Ser. No. 853,225
Claims priority, application France, Jul. 15, 1974, 74 25780
The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.
Int. Cl.[2] A01N *17/08*
U.S. Cl. 71—65 **4 Claims**

1. The method for treating plants with a phytosanitary material selected from the group consisting of an herbicide, insecticide, fungicide, growth regulator, bactericide and fertilizer, comprising applying water onto the plants from a stream of water, passing the stream of water, immediately prior to application onto the plants, into contact with a solid compact containing a few to 80% by weight of said phytosanitary material selected from the group consisting of an herbicide, insecticide, fungicide, growth regulator and fertilizer, a solid non-hydrophilic filler and 20–60% by weight of a solid water insoluble starch whereby the compact disintegrates progressively into the stream of water to release said phytosanitary material into the stream for application onto the plants.

4,182,621
COMPOSITION FOR INHIBITING THE GROWTH OF PLANTS

Yuzuru Ogata; Toshio Fukuhara, both of Tokushima, and Shigeru Araki, Naruto, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Bungomachi, Japan

Filed May 25, 1978, Ser. No. 909,524
Claims priority, application Japan, Feb. 1, 1978, 53-10874; May 12, 1978, 53-57011
Int. Cl.[2] A01N *5/00, 9/22*
U.S. Cl. 71—76 **6 Claims**

1. A composition for inhibiting the growth of plants comprising:
(1) 6-hydroxy-3-(2H)-pyridazinone or a salt thereof, said salt being at least one species selected from the group consisting of potassium, sodium, ethanolamine, diethanolamine and triethanolamine salts of 6-hydroxy-3-(2H)-pyridazinone,
(2) at least one compound represented by the formula:

$$R^1—O—[CH_2CH(R^2)—O]_l—H \quad (A)$$

wherein R^1 is an alkyl group having 6 to 12 carbon atoms, an alkenyl group having 6 to 12 carbon atoms, an aralkyl group having 6 to 12 carbon atoms, an alkylphenyl group having a C_6–C_{15}-alkyl group, or an alkylnaphthyl group having a C_8–C_{18}-alkyl group; R^2 is H or CH_3; and l is an integer of 3 to 30; and
(3) at least one compound represented by the formula:

$$R^3—O-[CH_2CH(R^4)—O]_m—SO_3M \quad (B)$$

wherein R^3 is an alkyl group having 6 to 12 carbon atoms, an alkenyl group having 6 to 12 carbon atoms, an aralkyl group having 6 to 12 carbon atoms, an alkylphenyl group having a C_6–C_{15}-alkyl group or an alkylnaphthyl group having a C_8–C_{18}-alkyl group; R^4 is H or CH_3; m is an integer of 1 to 100; and M is an alkali metal, an ammonium group, a quaternary ammonium group or H;

said composition containing a plant growth inhibiting amount of 6-hydroxy-3-(2H)-pyridazinone or a salt thereof, 0.001 to 1.5 parts by weight of the compound represented by the formula (A) per part by weight of the pyridazinone or salt thereof and 20 to 500% by weight of the compound represented by the formula (B) based on the compound represented by the formula (A).

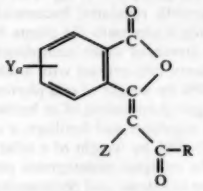
4,182,622

3-PHENACYLIDENE PHTHALIDE SAFENING AGENTS

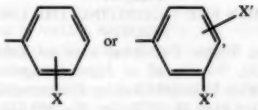
John A. Houbion, Kirkwood, and David E. Schafer, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 28, 1978, Ser. No. 929,133
Int. Cl.[2] A01N 9/00, 9/20
U.S. Cl. 71—88 **27 Claims**

1. A method of reducing injury to upland rice due to the application thereto of butachlor herbicide which comprises applying to said rice or to the growth medium an effective safening amount of a compound of the formula



wherein R is selected from phenyl,



X is selected from methyl, trifluoromethyl, bromo, fluoro, 2'-chloro, 2'-nitro, 4'-phenyl and 2' or 3'-methoxy, X' is methoxy or ethoxy, Y is selected from 4-methoxy and 4 or 5-chloro, Z is hydrogen or bromo, and a is zero or one.

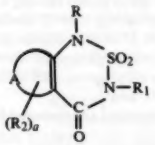
4,182,623

BICYCLOTHIADIAZINONES

James A. Kloek, Overland, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 27, 1977, Ser. No. 819,635
Int. Cl.[2] A01N 9/12
U.S. Cl. 71—91 **9 Claims**

1. A compound of the formula



wherein

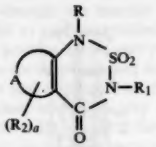
R, R_1 and $R_2)_a$ independently represent hydrogen, lower alkyl, alkenyl, alkynyl, alkoxy, alkoxyalkyl, polyalkoxy, cycloalkyl, aromatic hydrocarbon, lower alkanoyl, alkoxycarboalkyl or said R terms substituted with halo, nitro, hydroxy, cyano, CF_3, lower alkylthio or lower mono- or dialkylamino or alkanolamino groups;

A consisting essentially of a heterocyclic residue having up to 7 ring atoms containing only $S(O)_x$ as the hetero moiety;

a is 0–4 and

x is 0, 1 or 2.

4. Compositions comprising a herbicidally effective amount of a compound of the formula



wherein

R, R_1 and $(R_2)_a$ independently represent hydrogen, lower alkyl, alkenyl, alkynyl, alkoxy, alkoxyalkyl, polyalkoxy, cycloalkyl, aromatic hydrocarbon, lower alkanoyl, alkoxycarboalkyl or said R terms substituted with halo, nitro, hydroxy, cyano, CF_3, lower alkylthio or lower mono- or dialkylamino or alkanolamino groups;

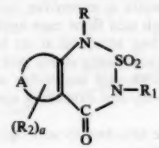
A consisting essentially of a heterocyclic residue having up to 7 ring atoms containing only $S(O)_x$ as the hetero moiety;

a is 0–4;

x is 0, 1 or 2 and

an inert adjuvant therefor.

7. Method for selectively controlling undesired plants in the presence of crop plants which comprises applying to the locus thereof a herbicidally-effective amount of a compound of the formula



wherein

R, R_1 and $(R_2)_a$ independently represent hydrogen, lower alkyl, alkenyl, alkynyl, alkoxy, alkoxyalkyl, polyalkoxy, cycloalkyl, aromatic hydrocarbon, lower alkanoyl, alkoxycarboalkyl or said R terms substituted with halo, nitro, hydroxy, cyano, CF_3, lower alkylthio or lower mono- or dialkylamino groups;

A consisting essentially of a heterocyclic residue having up to 7 ring atoms containing only $S(O)_x$ as the hetero moiety;

a is 0–4;

x is 0, 1 or 2 and

an inert adjuvant therefor.

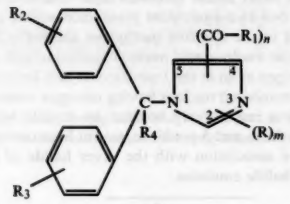
4,182,624

IMIDAZOLE CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

Alfons Söder, Frankfurt am Main; Hermann Bieringer, Eppstein; Helmut Bürstell, Frankfurt am Main; Peter Langelüddeke, Hofheim am Taunus, and Burkhard Sachse, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

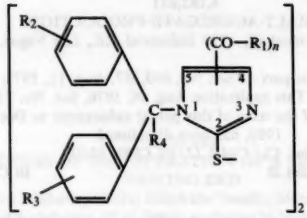
Filed Jul. 17, 1978, Ser. No. 925,546
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1977, 2732531
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—92 **12 Claims**

1. Imidazole-carboxylic acids and their derivatives of formulae



(I)

and



(II)

in which

m is zero, 1 or 2,

n is 1 or 2, and

m+n is equal to or smaller than 3;

R is halogen, (C_1–C_6)alkyl, allyl, hydroxy(C_1–C_6)alkyl, halo(C_1–C_6)alkyl, thiol, (C_1–C_6)alkylthio, cyano, phenyl or phenyl(C_1–C_2)alkyl;

R_1 is hydroxy, (C_1–C_6)alkoxy, hydroxy(C_2–C_6)alkoxy, (C_2–C_6)alkoxyalkoxy, di(C_1–C_3)alkylphosphinyl-(C_1–C_3)-alkoxy, di(C_1–C_3)alkylphosphinyl-(C_2–C_3)hydroxyalkoxy, amino, (C_1–C_6)alkylamino, di(C_1–C_6)alkylamino, di(C_1–C_3) alkylamino-(C_1–C_3)alkylamino, hydroxyamino, (C_1–C_3)alkoxyamino; N-(C_1–C_3)-alkyl-N-(C_1–C_3)-alkoxyamino, anilino, N-pyrrolidino, N-piperidino, N-morpholino, hydrazino, N'-(C_1–C_3)-alkylhydrazino, N',N'-dimethylhydrazino or N'-phenylhydrazino;

R_2 and R_3, which can be identical or different, are hydrogen, halogen, (C_1–C_3)alkyl, trifluoromethyl, hydroxy, (C_1–C_3)alkoxy, halo-(C_1–C_3)alkoxy, (C_1–C_3)alkylthio, cyano, nitro or acetamino, and

R_4 is hydrogen or phenyl,

and the non-toxic salts thereof with acids or bases.

9. A plant growth regulating composition containing a growth-regulating amount of a compound as claimed in claim **1**.

10. A composition for combating fungi and plant-pathogenic bacteria in plants, said composition containing an anti-fungi and anti-plant pathogen effective amount of a compound as claimed in claim **1**.

11. A method of controlling plant growth which comprises applying to the plants a growth regulating amount of a compound as claimed in claim **1**.

12. A method combating fungi and plant-pathogenic bacteria on plants which comprises applying to said plants an anti-fungi and anti-plant pathogen effective amount of a compound as claimed in claim **1**.

4,182,625
3-HALO-5-(LOWER ALKOXY) PHENOXY ALKYL AMIDES

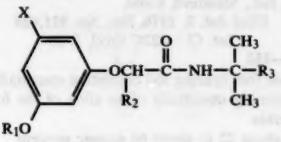
Don R. Baker, Orinda, and Frank H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 812,957, Jul. 5, 1977, Pat. No. 4,119,433. This application Jun. 28, 1978, Ser. No. 920,094

Int. Cl.[2] **A01N** *9/20;* **C07C** *121/60*

U.S. Cl. 71—105 **5 Claims**

1. A compound having the formula



in which X is halogen, R_1 is lower alkyl, R_2 is lower alkyl and R_3 is cyano.

4,182,626
PRODUCTION OF GRANULAR COMPOSITIONS CONTAINING PULVERULENT MAGNESIUM

Georg Strauss; Wilhelm Portz, both of Erftstadt; Albert Braun, Hürth-Burbach; Joachim Kandler, Erftstadt; Klaus Komorniczyk, Kerpen, and Hans-Dieter Thiel, Hurth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 20, 1978, Ser. No. 917,377

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 2728744

Int. Cl. C21C *7/02*

U.S. Cl. 75—58 **6 Claims**

1. A process for making a granular composition consisting of pulverulent magnesium metal in admixture with a major proportion of a fine particulate alkaline earth metal compound or a mixture of such compounds for using the composition in the desulfurization of an iron melt; the said composition being made by blending the pulverulent magnesium metal with the alkaline earth metal compound which process comprises: forming in a first stage a premix by mixing the pulverulent magnesium metal with the alkaline earth metal compound in a ratio by weight of 4:1 to 1:19; and intimately mixing in a second stage this pre-mix obtained with further proportions of said alkaline earth metal compound(s) giving a total ratio by weight of magnesium metal to alkaline earth metal compound(s) from 1:799 to 1:19.

4,182,627
BALLS CONTAINING TUNGSTEN CARBIDE

William H. Hardwick, Didcot; Peter F. Wace, Littlemore, and Peter J. Alder, Wantage, all of England, assignors to National Research Development Corporation, London, England

Filed Sep. 21, 1978, Ser. No. 944,654

Claims priority, application United Kingdom, Sep. 26, 1977, 40049/77

Int. Cl.[2] **B22F** *5/00, 7/06*

U.S. Cl. 75—0.5 AC **7 Claims**

1. A process for producing balls of cobalt containing tungsten carbide, the process comprising forming droplets of a liquid mixture comprising: particles of tungsten carbide; guar gum; a dissolved cobalt salt; and a non-ionic wetting agent; contacting the droplets for not more than 1 hour with a base to precipitate a cobalt species, thereby forming droplets of a gel precipitate, placing the droplets of the gel precipitate in a vessel having a thermal conductivity not exceeding 100 cal/-sec/cm^2, and heating the vessel in a reducing atmosphere to remove the guar gum and to sinter the tungsten carbide and

cobalt, thereby forming sintered balls of cobalt containing tungsten carbide.

4,182,628

PARTIALLY AMORPHOUS SILVER-COPPER-INDIUM BRAZING FOIL

Thomas L. D'Silva, Belmont, Calif., assignor to GTE Sylvania Products, Inc., Stamford, Conn.

Filed Jul. 3, 1978, Ser. No. 921,425

Int. Cl.[2] C22C *9/00, 5/06*

U.S. Cl. 75—153 **3 Claims**

1. A ductile thin brazing foil consisting essentially of a composition consisting essentially of an alloy of the formula $Ag_x Cu_y In_z$ wherein

x is from about 25 to about 66 atomic percent

y is from about 16 to about 68 atomic percent

z is from about 7 to about 18 atomic percent and containing an amorphous phase and a metastable, microcrystalline, solid solution single phase and having a thickness of from about 0.0005 to about 0.005 inches.

4,182,629

PHOTOCHROMIC COMPOUNDS

Harold G. Heller, 11 Erwgoch, Waunfawr, Aberystwyth, Dyfed 3AZ, Wales

Division of Ser. No. 801,915, May 31, 1977, which is a continuation-in-part of Ser. No. 502,095, Aug. 30, 1974, abandoned. This application Dec. 19, 1978, Ser. No. 971,037

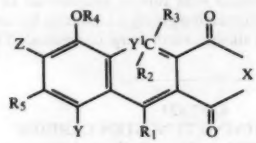
Claims priority, application United Kingdom, Sep. 1, 1973, 41233/73

Int. Cl.[2] G03C *5/24, 1/52*

U.S. Cl. 430—338 **6 Claims**

1. A method of forming a temporary image on a surface using activating radiation which comprises the steps of:

(a) forming a photochromic surface comprising a photochromic compound having the general formula (1) below and a support therefor,



(1)

wherein X represents oxygen or $>NR_6$, R_6 being hydrogen, alkyl, aryl or aralkyl,

R_1 represents alkyl, aryl or aralkyl,

Y and Y^1 are the same or different and represent hydrogen, alkyl, halogen or alkoxy,

Z represents hydrogen, halogen, alkyl, alkoxy or aryloxy,

R_5 represents hydrogen, alkyl, alkoxy or aryloxy,

R_4 represents alkyl, aryl or aralkyl and

R_2 and R_3 represent the same or different alkyl, aryl, or aralkyl groups or one of R_2 and R_3 represents hydrogen and the other is alkyl, aryl or aralkyl, and

(b) subjecting the photochromic surface to activating radiation using imaging means whereby areas of the surface exposed to the radiation exhibit a colour change or tone resulting from reversible photocyclisation of the photochromic compound.

4,182,630

PIVALYL-ACETANILIDE COUPLERS AND PHOTOGRAPHIC ELEMENTS INCLUDING THEM

Andrea Quaglia, Albisola Mare, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 23, 1975, Ser. No. 589,527

Claims priority, application Italy, Jun. 26, 1974, 51757 A/74

Int. Cl.[2] G03C *1/40, 7/00*

U.S. Cl. 430—558 **8 Claims**

1. A multilayer color photographic element including a base and at least one silver halide emulsion layer characterized by having at least one two-equivalent pivalylacetanilide coupler having attached to the reactive methylene thereof a 5-membered heterocyclic nucleus, said nucleus bonded to said methylene from a nitrogen atom in the 1-position on said heterocyclic nucleus, said 5-membered nucleus having nitrogen atoms in the 2- and 4-positions respectively bonded by double bonds to carbon atoms in the 3- and 5-positions, said at least one coupler being in reactive association with the silver halide of said at least one silver halide emulsion.

4,182,631

ASPHALT-AGGREGATE PRODUCTION

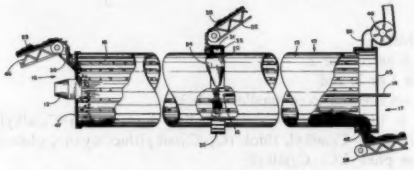
Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Continuation-in-part of Ser. No. 603,357, Aug. 11, 1975, Pat. No. 3,999,743. This application Aug. 26, 1976, Ser. No. 718,063

The portion of the term of this patent subsequent to Dec. 28, 1993, has been disclaimed.

Int. Cl.[2] C04B *13/30;* **C08L** *95/00*

U.S. Cl. 106—281 R **10 Claims**



1. A process for producing asphalt-aggregate compositions comprising:

(a) separating non-asphalt containing aggregate into coarse particles and fine particles;

(b) introducing said coarse particles in a hot zone of a rotatable drum and gradually heating and advancing said particles toward an output drum end;

(c) introducing said fine particles in said drum downstream from said hot zone in a cooler temperature zone;

(d) gradually mixing and heating said coarse and fine particles; and

(e) adding and mixing asphalt with said particles downstream from said hot zone to produce said asphalt-aggregate composition.

4,182,632

DIFFUSER

James M. Cargill, c/o Huletts Sugar Limited, P.O. Box Mount Edgecombe, 4300 Natal, South Africa

Filed Sep. 14, 1977, Ser. No. 833,177

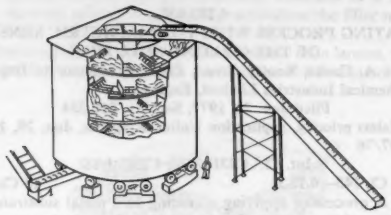
Claims priority, application United Kingdom, Sep. 14, 1976, 38018/76

Int. Cl.[2] C13D *1/00;* **B01D** *11/00*

U.S. Cl. 127—5 **1 Claim**

1. Diffusion apparatus comprising vertically disposed stationary screens about a fixed central cylindrical column, liquid collecting trays located below the screens, the trays being attached to the central column, the screens and trays being

located in an annulus defined by the central column and the outer shell of the apparatus, said shell being rotatable, and



radial members being attached to the outer shell and being arranged to move the material being treated over the screens.

4,182,633

PROCESS OF THE OPERATION OF A SIMULATED MOVING BED

Hachiro Ishikawa, Chofu; Hidekatu Tanabe, Hatano, and Keizo Usui, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Dec. 19, 1977, Ser. No. 862,163
Claims priority, application Japan, Dec. 21, 1976, 51-153668; Jan. 13, 1977, 52-2576
Int. Cl.² C13K *1/00, 3/00, 11/00;* C13D *3/14*
U.S. Cl. 127—46 A **10 Claims**

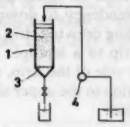
1. In the operation of a simulated moving bed comprising flowing a fluid containing a sorbed component and a non-sorbed component in one direction along a bed packed with a solid sorbent and having the upstream end and the downstream end interconnected to form a circulation loop, introducing a feed stock and a desorbent to the circulating fluid and withdrawing the sorbed component and the non-sorbed component therefrom at selected positions of the bed and shifting downstream the positions of the feed stock inlet, the non-sorbed component outlet, the desorbent inlet and the sorbed component outlet at a predetermined time interval, the improvement in which the concentration of at least one component in the fluid flowing through the bed is measured as at least one point in the path of fluid to predict a concentration distribution of the selected component and the flow rate of the fluid is controlled to maintain the predicted concentration distribution in the desired wave pattern of concentration distribution.

4,182,634

PROCESS FOR PURIFYING MALTOSE SOLUTION

Masaru Yamada; Atsushi Mori; Yoshiyasu Sato; Kenichi Terayama, and Shogo Miyatani, all of Kitami, Japan, assignors to Hokkaido Sugar Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1978, Ser. No. 898,073
Claims priority, application Japan, Apr. 21, 1977, 52-45175
Int. Cl.² C13D *3/12*
U.S. Cl. 127—55 **4 Claims**



1. A process for purifying a maltose solution by means of activated carbon, which process comprises:

(a) pretreating the activated carbon by bringing it into contact with the aqueous solution of one organic solvent selected from the group consisting of methanol, ethanol and acetone,

(b) adding the same organic solvent to the maltose solution being subjected to the treatment until the organic solvent concentration in the solution equals that in the aqueous solution of organic solvent in step (a),

(c) feeding the organic solvent-containing maltose solution to a bed formed of the pretreated activated carbon,

(d) feeding the same aqueous solution as that used in step (a) to the activated carbon bed to which the supply of the maltose solution was fed in step (c),

(e) recovering a maltose-rich eluate from the activated carbon bed, and

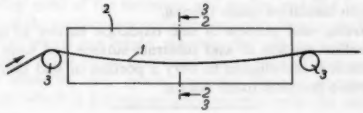
(f) separating the organic solvent from the recovered eluate.

4,182,635

METHOD OF HEAT TREATMENT OF DUCTILE METAL STRIP

Peter K. F. Limbach, Goettingen, Fed. Rep. of Germany, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Dec. 27, 1977, Ser. No. 864,469
Claims priority, application United Kingdom, Dec. 29, 1976, 54208/76
Int. Cl.² B05C *13/10;* C21D *9/52*
U.S. Cl. 148—130 **4 Claims**



1. A process involving heating aluminium or other ductile metal strip while under tension in the form of a catenary during passage through a heating zone where a higher temperature is produced along the centre line of the strip than along its edges, the improvement which consists in arranging that the metal strip has a tendency toward downwardly convex transverse curvature on the lower side of the catenary so that the tensile stress in the strip is greater on its centre line that at its edges, said tendency to downwardly convex transverse curvature being achieved by drawing the strip from a supply coil in such manner that the outer surface of the strip in the coil lies on the underside of the strip in the catenary so that the tendency to

downwardly convex transverse curvature results from the "coil-set" of said supply coil, said process further comprising, before drawing the strip from the coil, the step of subjecting the coil to a heat treatment to stabilize "coil-set".

3. A process involving heating aluminium or other ductile metal strip while under tension in the form of a catenary during passage through a heating zone where a higher temperature is produced along the centre line of the strip than along its edges, the improvement which consists in arranging that the metal strip has a tendency towards downwardly convex transverse curvature on the lower side of the catenary so that the tensile stress in the strip is greater on its centre line than at its edges, the provision of said tendency to downwardly convex transverse curvature including drawing strip material from a supply coil, subjecting the strip to a multiple bending operation arranged to elongate the side of the strip, which is the underside in the catenary, in relation to the upper side and forwarding the strip to the heating zone.

4,182,636

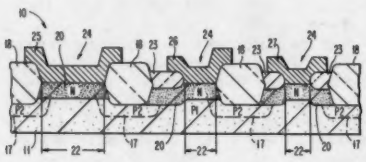
METHOD OF FABRICATING SELF-ALIGNED CONTACT VIAS

Robert H. Dennard, Croton-on-Hudson, and Vincent L. Rideout, Mohegan Lake, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,913

Int. Cl.[2] H01L *21/22*

U.S. Cl. 148—187 **16 Claims**



1. In a process for fabricating semiconductor integrated circuits on a semiconductor substrate containing at least an oxidation barrier covered region on the surface thereof, said oxidation barrier covered region being formed by patterning and etching an oxidation barrier layer, which steps expose the remainder of said substrate surface, said remainder of said substrate surface being covered with a thermally grown recessed oxide region the latter being formed by thermally oxidizing said remainder of said substrate surface, the steps of:

masking a portion of said oxidation barrier,

applying an etchant to the unmasked oxidation barrier to etch it away and expose a portion of said substrate surface,

reoxidizing said exposed portion of said substrate surface to form insulation oxide therein,

removing said portion of said oxidation barrier to expose another portion of said substrate surface and form a via which is self-aligned to only a portion of said thermally grown recessed oxide region.

4,182,637

POST PHOSPHATING INHIBITING RINSE

Joseph V. Otrhalek, Dearborn; Raymond M. Ajluni, West Bloomfield Township, Oakland County, and Gilbert S. Gomes, Southgate, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 800,558, May 25, 1977, Pat. No. 4,124,414. This application Dec. 19, 1978, Ser. No. 970,889

Int. Cl.[2] C23F *7/10*

U.S. Cl. 148—6.14 R **2 Claims**

1. An inhibiting rinse for sealing phosphated ferrous metal surfaces, comprising a solution consisting essentially of water, from about 0.40 to about 2.2 grams per liter of nitrite ions, and about 0.05 to about 0.5 grams per liter of citrate ion, and with the pH of the solution being in the range of about 4 to 5.

4,182,638

COATING PROCESS WITH VOLTAMMETRIC SENSING OF THE COATING SOLUTION

Brian A. Cooke, Knotty Green, England, assignor to Imperial Chemical Industries Limited, England

Filed Jun. 24, 1977, Ser. No. 810,354

Claims priority, application United Kingdom, Jun. 28, 1976, 26797/76

Int. Cl.[2] C23F *7/10*; C23C *3/00*

U.S. Cl. 148—6.15 R **18 Claims**

1. A process of applying a coating to a metal substrate by reaction of the metal with a coating solution which comprises at least one electroactive constituent which takes part in an electrode reaction at a definite electrode potential or within a definite electrode potential range, giving rise to a current whose magnitude is a function of the concentration of that constituent and wherein the effective concentration of the electroactive constituent in the coating solution is sensed voltammetrically at an indicating electrode comprised of noble metal, the concentration of the electroactive constituent in the coating solution being subsequently adjusted in response to deviations in the voltammetric current from an optimum value.

4,182,639

METHOD FOR IMPROVING THE ADHESION OF BRASS-COATED STEEL CORD TO RUBBER

Arthur J. Pignocco, Murrysville Boro, and Michael E. Waitlevertch, North Huntingdon Township, Westmoreland County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1978, Ser. No. 958,457

Int. Cl.[2] C23F *7/12*; B60C *9/16*

U.S. Cl. 148—6.17 **10 Claims**

1. Method of treating brass-coated steel tire cord to enhance its adhesion to rubber comprising forming a coating thereon of phosphate corrosion inhibitor and a sulfur-containing rubber vulcanization accelerator in a ratio of from about 0.8:1 to about 4:1.

4,182,640

ALUMINUM ALLOY ELECTRIC CONDUCTOR WIRE

Minoru Yokota, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 663,673, Mar. 4, 1976, abandoned, which is a continuation of Ser. No. 467,220, May 6, 1974, abandoned. This application Oct. 3, 1977, Ser. No. 838,762

Claims priority, application Japan, May 17, 1973, 48-55075

Int. Cl.[2] C22C *21/00*

U.S. Cl. 148—32 **6 Claims**

1. An aluminum alloy electric conductor wire comprising a wire having excellent heat-resistant properties and consisting essentially of 0.01–0.5% copper, 0.01–0.5% Zirconium, 0.05–1.0% iron and a balance of aluminum and impurities, having a magnesium content of 0.1% at the most, and having excellent heat-resistance properties and a minimum tensile strength of 20 Kg/mm^2 under hard-drawn condition, said conductor wire being in a state of hard-drawn condition.

4,182,641

METHOD OF FORMING LAMINA AND BLOCK LAMINATES

Martin E. Fitts, Portland, Oreg., assignor to Core-Lock Foam, Inc., Bend, Oreg.

Filed Apr. 21, 1978, Ser. No. 898,871

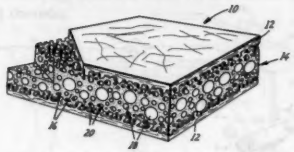
Int. Cl.[2] B32B *5/18*

U.S. Cl. 156—77 **6 Claims**

1. A method of forming a laminate composed of a solid resin lamina secured to a surface of a block comprising

preparing a block comprising a matrix composed of a solid resin matrix material, and particles composed of a solid resin filler material distributed in said matrix, said resin matrix material being substantially insoluble in a filler material solvent which readily solubilizes the filler material,

preparing a layer of resin which forms the resin lamina, with such resin in a relatively unpolymerized liquid state,



placing a surface of said block in contact with said layer of resin, and

curing said layer of resin to produce a more highly polymerized solid resin lamina adhering to said block, the particles of resin filler material adjacent said surface prior to the curing of said layer of resin being dissolved by the application of filler material solvent to leave voids distributed in said matrix which are at least partially filled with the resin of said layer with such in its liquid state.

4,182,642

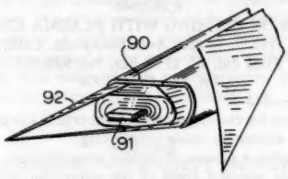
PIPELINE JOINT TESTER

Gerald J. VanderLans, 1310 W. Turner Rd., Lodi, Calif. 95240

Division of Ser. No. 738,839, Nov. 4, 1976, Pat. No. 4,070,904. This application Oct. 31, 1977, Ser. No. 847,073

Int. Cl.[2] B65H *81/00*

U.S. Cl. 156—121 **3 Claims**



1. A method for making an annular hollow gasket with normally flat radially inner and outer walls for use in pipe-joint testing apparatus and the like including the steps of:

wrapping a strip of unvulcanized rubber around a long rectilinear flat strip mandrel to encircle it several times to provide walls thicker than said mandrel,

interleaving a sheet of tire cord having parallel threads, on a bias, between two successive layers of said strip for more than 180 degrees,

removing the mandrel from the wrapped and interleaved assembly so as to leave a long hollow passage where the mandrel was,

confining the assembly in a mold having a cavity with flat walls and of approximately the same volume as said assembly while inflating the passage with air under pressure to assure contact of the assembly with the mold cavity walls,

vulcanizing the assembly under heat to unify the assembly into the shape of an enlongated strip with a passage therethrough, the strip having flat surfaces and walls thicker than said passage when the passage is uninflated,

cutting the strip at at chosen lengths, each along a plane inclined to the axis of said strip at the same angle,

bringing each of the chosen lengths into an annular shape with meeting ends, and

vulcanizing the meeting ends together to give each annular gasket.

4,182,643

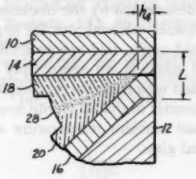
METHOD OF FORMING GAPS IN MAGNETIC HEADS

Arthur Calderon, Jr., Minnetonka; Douglas J. Hennenfent, Minneapolis, and Allan L. Holmstrand, Bloomington, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 813,017, Jul. 5, 1977, abandoned. This application May 8, 1978, Ser. No. 904,053

Int. Cl.[2] C25D *1/00*

U.S. Cl. 156—151 **13 Claims**



1. A process for forming a gap for a magnetic head comprising the steps of: sputter depositing a layer of nonmagnetic spacer material onto portions of the confronting surfaces of each of at least two substantially rigid magnetic members; sputter depositing a layer of bonding material onto each layer of spacer material and onto the remaining exposed portions of the confronting surfaces of said magnetic members said spacer material not being appreciably reactive with either said bonding material or said magnetic members; positioning the magnetic members so that the layers of spacer material confront each other and said layers of bonding material are contiguous along a first line in the region of said confronting surfaces not including said layers of spacer material and along a second line in the region of said confronting surfaces between said layers of spacer material, said members being disposed at an angle whose sine/tangent is essentially equal to the thicknesses of said layers of spacer material divided by the distance between said first and second lines; pressing said members together while maintaining said bonding material at a predetermined temperature to fuse portions of said layers of bonding material together and to displace bonding material from portions of the regions between the confronting surfaces to bring the confronting surfaces of said magnetic members into contiguous relation at the region of said first line and to bring the layers of spacer material into contiguous relation in the region of said second line; cooling the members to ambient temperature; and removing most of the members and spacer material from the region of the confronting surfaces thereof to form a gap having a predetermined gap height, whereby the gap has a gap length essentially equal to the combined thicknesses of said layers of spacer material, said spacer material being a nonmagnetic material which is not appreciably reactive with the magnetic members.

9. A process of forming a gap for a magnetic head comprising the steps of: sputter depositing a first layer of spacer material onto the end surface of a first leg of a substantially rigid C-core ferrite member; sputter depositing a second layer of spacer material onto a portion of a surface of a substantially rigid I-core ferrite member; sputter depositing a first layer of bonding glass onto the first layer of spacer material and onto the end surface of the second leg of said C-core ferrite member; sputter depositing a second layer of bonging glass onto the second layer of spacer material and onto the remaining portion of the surface of said I-core ferrite member, each of said layers being of essentially uniform thickness; positioning said members so that said layers of spacer material are in confronting

relation and said first and second layers of bonding glass are contiguous along a first line adjacent one edge of said second leg of said C-core ferrite member and along a second line adjacent tne apex between the window and first leg of said C-core ferrite member whereby an angle is formed between said members whose sine/tangent is essentially equal to the thickness of said first and second layers of spacer material divided by the distance between said first and second lines; pressing the members together while simultaneously heating the layers of bonding glass to at least its softening temperature to fuse portions of the layers of bonding glass together and to extrude bonding glass from portions of the regions between said members; cooling the members to ambient temperature; and removing most of the first leg of said C-core ferrite member and the confronting portion of said I-core member to form a gap having a predetermined gap height, whereby said gap has a gap length determined by the thickness of said first and second layers of spacer material plus the gap height times the sine/tangent of said angle, said spacer material being a non-magnetic material which is not appreciably reactive with ferrite or with glass and which has thermal expansion characteristics substantially similar to that of ferrite over the temperature range between said ambient temperature and the softening temperature of said glass.

4,182,644

POLYMER IN MONOMER ADHESIVE COMPOSITION AND METHOD EMPLOYING SAME

Paul C. Briggs, Jr., Wilmington, and Lawrence C. Muschiatti, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 562,936, Mar. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 476,537, Jun. 5, 1974, abandoned. This application Sep. 8, 1978, Ser. No. 940,618

The portion of the term of this patent subsequent to Jun. 17, 1992, has been disclaimed.

Int. Cl.[2] B32B *7/00*; C08L *61/20*

U.S. Cl. 156—310 **7 Claims**

1. A process for bonding two surfaces together which comprises applying to at least one of the surfaces an amine aldehyde polymerization accelerator, and then applying a composition containing (a) at least one polymer dissolved in (b) at least one polymerizable monomer selected from the class consisting of acrylic and methacrylic monomers, (c) an organic sulfonyl chloride selected from the class consisting of organic sulfonyl chlorides having up to 20 carbon atoms and chlorosulfonated polymers, and (d) an organic hydroperoxide free radical polymerization catalyst to at least one surface, and then bringing the surfaces sufficiently close together that the accelerator and the composition containing the dissolved polymer fill the gap between the surfaces.

2. An adhesive composition comprising (a) at least one polymer dissolved in (b) at least one polymerizable monomer selected from the class consisting of acrylic and methacrylic monomers (c) an organic sulfonyl chloride selected from the class consisting of organic sulfonyl chlorides having up to 20 carbon atoms and chlorosulfonated polymers, (d) an organic hydroperoxide free radical polymerization catalyst and (e) an aldehyde-amine condensation product accelerator, the organic sulfonyl chloride being present in the composition in the amount such that about 3 to 160 mmoles of sulfonyl chloride groups are present per 100 grams of polymer, the polymer being present in the solution in the amount of 10 to 75 percent by weight of the solution, the adhesive having a Brookfield viscosity in the range of 2,000 centipoise to 1,000,000 centipoise.

4,182,645

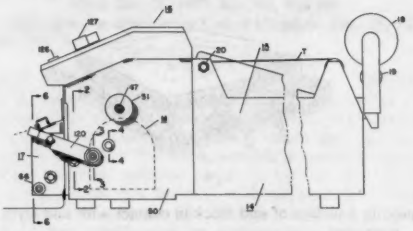
PRESSURE-SENSITIVE TAPE MACHINE WITH STRIPPER

Forrest G. Hill, East St. Louis, Ill., assignor to Marsh Stencil Machine Company, Belleville, Ill.

Filed Oct. 31, 1977, Ser. No. 846,703

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—361 **19 Claims**



1. In a tape-feeding machine for removing the liner from a laminated pressure-sensitive tape having a liner on the adhesive face of the tape: means for engaging the laminated tape and for applying a forward force to the same, for positively feeding the laminated tape at a predetermined speed toward the location where the liner can be peeled off the tape, the said feeding means being adjacent the said location; means at the said location for directing the tape in one direction; means for directing the liner in a direction at an angle of at least about 90° from the tape for peeling the liner from the tape; means for positively engaging the liner, pulling the liner, and putting it under tension as it is drawn from the tape; and motor means for causing simultaneous continuous movement of the feeding and pulling means whenever they are operated.

4,182,646

PROCESS OF ETCHING WITH PLASMA ETCH GAS

John Zajac, 1115 E. Arques Ave., Sunnyvale, Calif. 94086

Filed Jul. 27, 1978, Ser. No. 928,597

Int. Cl.[2] C23F *1/00*

U.S. Cl. 156—643 **14 Claims**

1. A process for etching an aluminum article having thereon, a coating of aluminum oxide comprising:

A. developing a plasma of carbon tetrachloride;

B. exposing selected areas of the aluminum article to the carbon tetrachloride plasma until substantially all aluminum oxide has been removed in said selected areas; and

C. etching said aluminum article in areas where said aluminum oxide has been removed with a plasma comprised of carbon tetrachloride and chlorine wherein:

(1) the total pressure of the carbon tetrachloride and chlorine plasmas is at or below approximately 250 microns;

(2) the partial pressure of chlorine plasma is at or below approximately 100 microns; and

(3) the partial pressure of chlorine plasma is below the partial pressure of carbon tetrachloride plasma.

4,182,647

PROCESS OF PRODUCING STRIPE FILTER

Satoshi Yoshihara, Kawasaki, and Nobuyuki Sekimura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1978, Ser. No. 877,687

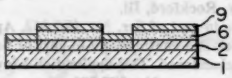
Claims priority, application Japan, Feb. 21, 1977, 52-17898

Int. Cl.[2] C23F *1/02*

U.S. Cl. 430—314 **3 Claims**

1. A process for producing a parallel type of stripe filter which comprises the steps of:

(a) processing a metal layer (I) formed on the surface of a transparent base plate into predetermined parallel stripes,
(b) forming a dichroic layer (I) having pre-determined spectral characteristics on the whole surface of the resulting structure by vapor deposition,
(c) forming a metal layer (II) on said dichroic layer (I) by vapor deposition,
(d) dissolving said metal layer (I) in the stripe configuration with an etching solution to remove that layer together with the overlying dichroid layer (I) and metal layer (II) deposited thereon,



(e) forming a dichroic layer (II) having spectral characteristics different from those of said dichroic layer (I) on the whole surface of the resulting structure by vapor deposition, and
(f) dissolving said metal layer (II) with an etching solution to remove that layer together with the dichroic layer (II) deposited thereon, the etching solution used for dissolving said metal layer (II) being different from that used for dissolving said metal layer (I).

4,182,648

OXYGEN PULPING PROCESS

Louis A. Pradt, and William M. Copa, both of Wausau, Wis., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 224,340, Feb. 7, 1972, abandoned. This application Oct. 26, 1973, Ser. No. 409,960
Int. Cl.[2] D21C *3/02*
U.S. Cl. 162—38 **12 Claims**

1. In the process for delignifying a cellulosic raw material by treating said material in a high pressure reaction vessel with high pressure oxygen-containing gas in the presence of alkaline buffer solution, the improvement which comprises carrying out the process in an unflooded condition where the alkaline buffer solution is applied to the raw cellulose so that contact of said solution with said cellulose is intermittent, gaseous and liquid phases both being present at all times.

4,182,649

POLYURETHANE FOAM SHEET AND METHOD

Irving E. Isgur, Framingham; Andrew B. Holmstrem, Burlington, and Norman J. Hayes, Bedford, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Continuation-in-part of Ser. No. 656,674, Feb. 9, 1976, Pat. No. 4,110,508. This application Feb. 11, 1977, Ser. No. 767,994
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—101 **35 Claims**

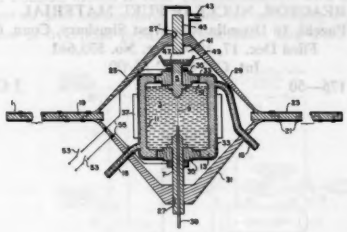
1. A method for preparing a compressible, resilient, homogenous composite sheet having sufficiently low modulus of compression to provide a cushioning effect, said method comprising
(A) forming an aqueous dispersion of fibers,
(B) forming an aqueous dispersion of particles of hydrophilic polyurethane foam prepared by dispersing a prepolymer of a hydrophilic oxyalkylene polyol capped with an isocyanate in water and allowing the isocyanate groups to react essentially simultaneously with the water to form polyurethane particles in-situ, wherein said prepolymer is from about 10 to about 60% by weight, based on total weight of prepolymer and fibers, wherein said polyol has a molecular weight from about 200 to about 20,000 and contains at least 50 mole percent oxyethylene units, wherein the size of the polyurethane particles are not less than about 0.01 inch mesh, and wherein from about 7 to about 50 parts of water is used for every part of prepolymer,
(C) mixing dispersion (A) and (B),
(D) wet-layering the mixed dispersion onto a support, and
(E) removing water from the resulting supported fiber/foam sheet.

4,182,650

PULSED NUCLEAR FUSION REACTOR

Albert G. Fischer, Preinstr. 132, 46 Dortmund-Wellinghofen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 361,211, May 17, 1973, abandoned. This application Dec. 3, 1973, Ser. No. 421,052
Int. Cl.[2] G21B *1/00*
U.S. Cl. 176—8 **13 Claims**



1. A nuclear fusion reactor comprising a reaction chamber containing a liquid conductive medium, means for repetitively establishing a reaction zone in said medium, means for producing a high current electrical discharge through said reaction zone upon each reestablishment thereof, and means for absorbing heat generated by the resulting fusion reactions, said conductive medium including lithium deuteride.

4,182,651

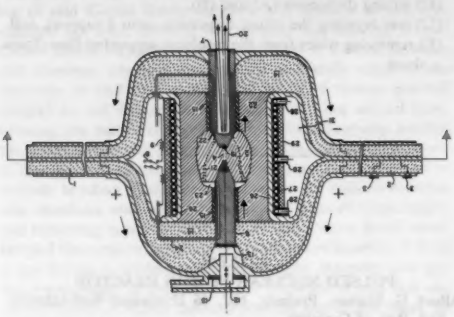
PULSED DEUTERIUM LITHIUM NUCLEAR REACTOR

Albert G. Fischer, Preinstrasse 132, 46 Dortmund-Wellinghofen, Fed. Rep. of Germany

Filed Jun. 10, 1974, Ser. No. 478,170
Int. Cl.[2] G21B *1/00*
U.S. Cl. 176—8 **9 Claims**

1. A nuclear fusion reactor comprising a reaction chamber containing lithium deuterotritide, dielectric members closing opposite ends of said chamber, opposed electrodes extending through said dielectric members and spaced apart within the chamber to form a discharge path between them at the center of the chamber, heat exchange means adjacent the outer periphery of the chamber between the dielectric members to remove heat from the chamber and to maintain the temperature of said lithium deuterotritide below its melting point except in the region of said discharge path, means for repetitively

establishing a reaction zone by passage of an electric current between said electrodes, and means for producing a high energy electrical discharge between the electrodes upon each reestablishment of said reaction zone.



4,182,652

NUCLEAR FUEL ELEMENT, CORE FOR NUCLEAR REACTOR, NUCLEAR FUEL MATERIAL

Karl H. Puechl, 16 Drumlin Rd., West Simsbury, Conn. 06092

Filed Dec. 17, 1974, Ser. No. 533,641

Int. Cl.[2] G21C *15/00*

U.S. Cl. 176—50 **7 Claims**

1. A homogeneous nuclear fuel material of a predetermined fissile content for replacing enriched uranium necessary for satisfactory reactor operation, said material consisting of recycled plutonium and uranium as nuclear reactive components, wherein said plutonium content is as small as practicable considering reactor demand, said plutonium content being less than 1% and the remainder being uranium, said material containing sufficient uranium of 235 enrichment which, when combined with the recycled plutonium, gives said material said predetermined fissile content.

4,182,653

MASS TRANSFER BETWEEN FLUIDS AND APPARATUS THEREFOR

Brian J. Bellhouse, Wendlebury, England, assignor to National Research Development Corporation, London, England

Filed Oct. 20, 1977, Ser. No. 843,932

Claims priority, application United Kingdom, Oct. 22, 1976, 43977/76

Int. Cl.[2] C12K *9/00*

U.S. Cl. 435—2 **9 Claims**

1. A method of oxygenating blood and removing carbon dioxide therefrom, such method comprising flowing blood through a first conduit at least partly defined by a microporous membrane, flowing oxygenating gas through a second conduit adjacent to said first conduit at least partly defined by said membrane, and pulsing said gas as it flows through said second conduit, so that oxygen is transferred from said second to said first conduit and carbon dioxide from said first to said second conduit, the rate of carbon dioxide transfer being maintained at a higher level than otherwise occurs without said pulsing.

4,182,654

PRODUCTION OF POLYPEPTIDES USING POLYNUCLEOTIDES

Garfield P. Royer, Worthington, Ohio, assignor to Pierce Chemical Company, Rockford, Ill.

Continuation-in-part of Ser. No. 680,467, Apr. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 507,198 Sep. 18, 1974, abandoned. This application May 19, 1978, Ser. No. 907,503

Int. Cl.[2] C12D *13/06;* **C07C** *103/52*

U.S. Cl. 435—70 **16 Claims**

1. A process for synthesizing a peptide chain having a distinct sequence of amino acid segments which comprises

(1) reacting a pure precursor complex, wherein a first amino acid segment of the peptide chain to be prepared is covalently bonded to a polynucleotide handle, and wherein said segment contains a free terminal carboxyl group or a free terminal amino group, with a second amino acid segment containing a free N^{α}-amino group and a blocked carboxyl group when the precursor has a free terminal carboxyl group or a free carboxyl group and a blocked N^{α}-amino group when the precursor has a free terminal amino group, in an aqueous medium;

(2) optionally removing the unreacted precursor complex;

(3) reversibly coupling the handle of the reacted complex to an adsorbent immobilized on an insoluble support;

(4) separating the reacted complex from unreacted second amino acid segment;

(5) releasing the handle from adsorbent;

(6) optionally deblocking the carboxyl group or amino group on the reacted complex;

(7) optionally reiterating steps (1) to (6) until the desired number of amino acid segments are added to the precursor;

(8) optionally releasing the peptide chain from the handle and recovering the product.

4,182,655

ENZYME IMMOBILIZATION WITH A PROTEIN CARRIER

Winfried Hartmeier, Bingen, Fed. Rep. of Germany, assignor to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Aug. 8, 1977, Ser. No. 823,007

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636206

Int. Cl.[2] C07G *7/00, 7/02*

U.S. Cl. 435—181 **8 Claims**

1. The process for the preparation of an immobilized enzyme composition which comprises dissolving a water-soluble protein in water to form a solution, adding a crosslinking agent to the solution to crosslink the protein and form a gel, drying the gel by heating to form a dried insoluble crosslinked protein having a water-absorption capacity of 2 to 8 times its dry weight, mixing the dry insoluble crosslinked protein with an enzyme-containing solution, allowing the insoluble crosslinked protein to swell and completely suck up the total amount of enzyme solution mixed with the dry insoluble crosslinked protein, and mixing the enzyme-containing swollen insoluble crosslinked protein with a solution of glutardialdehyde in a lower aliphatic alcohol or ketone to provide 0.5 to 5% glutardialdehyde in the resultant reaction mixture to bond the enzymes to the swollen insoluble crosslinked protein to provide the immobilized enzyme composition.

4,182,656

METHOD FOR DETECTING THE PRESENCE OF BIOLOGICALLY ACTIVE AGENTS UTILIZING ^{13}C-LABELED SUBSTRATES

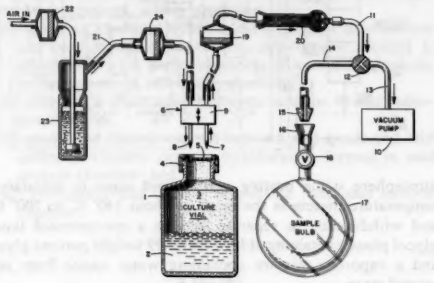
Joseph E. Ahnell, Baltimore; Rodney L. Broman, Falston, and John R. Waters, Towson, all of Md., assignors to Johnston Laboratories, Inc., Cockeysville, Md.

Filed Sep. 10, 1976, Ser. No. 722,270

The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.

Int. Cl.[2] C12K *1/04;* G01N *27/78, 33/16*

U.S. Cl. 435—34 **14 Claims**



1. A method for detecting the presence of biologically active agents comprising the steps of:

(a) providing a sterile, sealable container partially filled with a sterile, non-radioactive culture medium comprising a ^{13}C-labeled substrate fermentable to produce singly labeled $^{13}C^{16}O_2$; the remainder of said container being filled with a culture gas; said container comprising means for introducing a sample of material to be tested for the presence of biologically active agents into the container;

(b) introducing a sample of material to be tested for biological activity into said container and sealing said container;

(c) subjecting the sealed container and its contents to conditions conducive to biological activity for a predetermined period of time up to 48 hours sufficient for fermentation of the ^{13}C-labeled substrate to produce singly labeled $^{13}C^{16}O_2$;

(d) thereafter measuring the relative proportions of $^{13}CO_2$ and $^{12}CO_2$ in the culture gas and determining the ratio of singly labeled $^{13}C^{16}O_2$ to $^{12}CO_2$ in the culture gas in the container, and

(e) comparing the ratio determined in step (d) to a reference standard representing the initial ratio of singly labeled $^{13}C^{16}O_2$ to $^{12}CO_2$ in the culture gas to ascertain whether there has been an increase in the ratio of $^{13}C^{16}O_2$ to $^{12}CO_2$ indicative of the presence of a biologically active agent.

4,182,657

FLOATING PRESSURE CONTROL OF FRACTIONATOR SYSTEM

Harold J. Swindell, Gladstone, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 19, 1978, Ser. No. 952,913

Int. Cl.[2] B01D *3/42*

U.S. Cl. 203—2 **14 Claims**

1. Apparatus comprising:

fractionation column means for receiving at least one feed material stream and delivering an overhead product vapor stream from the top portion thereof;

pressure transducer means for sensing the pressure within said fractionation column means and delivering a fractionation column pressure signal representative of the thus sensed pressure;

first conduit means in flow communication with the top portion of said fractionation column means for providing a path for flow of said overhead product vapor stream therethrough;

condenser means in flow communication with said first conduit means for providing a path for flow of said overhead product stream therethrough and condensing at least a portion of said overhead product vapor stream passing therethrough so as to provide an overhead product condensate stream emanating from said condenser means;

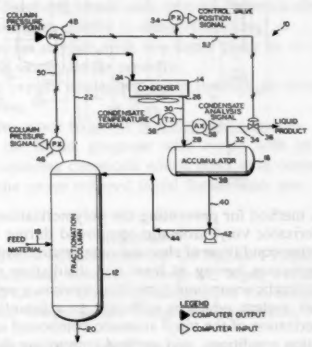
second conduit means in flow communication with said condenser means for providing a path for flow of said overhead product condensate stream therethrough;

temperature transducer means for sensing the temperature of said overhead product condensate stream and delivering a condensate temperature signal representative of the thus sensed temperature;

analyzer means for analyzing the composition of said overhead product and delivering an analysis signal representative of the thus analyzed composition of said overhead product components;

accumulator means having an inlet port and at least one outlet port, said inlet port being in flow communication with said second conduit means for receiving said overhead product condensate stream and accumulating a quantity of said overhead product condensate therein;

third conduit means in flow communication with an outlet port of said accumulator means for providing a path for flow of overhead product condensate, said third conduit



means including control valve means interposed therein for controlling the flow of overhead product condensate therethrough so as to control the fractionation column pressure;

fourth conduit means in flow communication with an outlet port of said accumulator means and in flow communication with said fractionation column means for providing a path for flow of overhead product condensate from said accumulator means to said fractionation column means;

pressure controller means operatively connected to said control valve means and reponsive to a column pressure set point signal and to said fractionation column pressure signal for controlling said control valve means;

means responsive to said fractionation column pressure signal and to said analysis signal for determining the bubble point temperature of said overhead product stream and delivering a bubble point temperature signal representative of the thus determined bubble point temperature;

means responsive to said condensate temperature signal and to said bubble point temperature signal for determining the difference between the determined bubble point temperature and the overhead product condensate stream temperature and delivering a temperature difference signal representative of the thus determined difference between the determined bubble point temperature and the overhead product condensate stream temperature; and

means responsive to a degrees subcooling set point signal

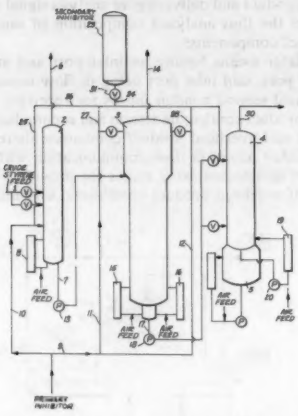
representative of a desired margin of subcooling of said overhead product condensate stream and to said temperature difference signal for determining a desired column pressure set point and delivering a column pressure set point signal representative of the thus determined column pressure set point to said pressure controller means.

4,182,658

EMERGENCY POLYMERIZATION INHIBITOR SYSTEM FOR VINYL AROMATIC COMPOUNDS

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Nov. 23, 1977, Ser. No. 854,379
Int. Cl.[2] B01D 3/34
U.S. Cl. 203—9 **11 Claims**



1. A method for preventing the polymerization of a readily polymerizable vinyl aromatic compound during distillation a distillation conditions of elevated temperature within a distillation apparatus having at least one distillation column, said vinyl aromatic compound containing a primary polymerization inhibitor system which is sufficient to substantially prevent polymerization of the vinyl aromatic compound under normal distillation conditions, said method comprising the steps of;

a. providing a pressurized solution of a polymerization inhibitor in an aromatic hydrocarbon diluent for use as a supplemental emergency polymerization inhibitor, said inhibitor being readily soluble in said diluent, said pressurized solution being selectively connected with each distillation column; and,

b. force-feeding said solution into each distillation column of said distillation system in an amount sufficient to prevent polymerization of the vinyl aromatic compound therein in response to a change in distillation conditions which renders said primary polymerization inhibitor inoperative for its intended purpose.

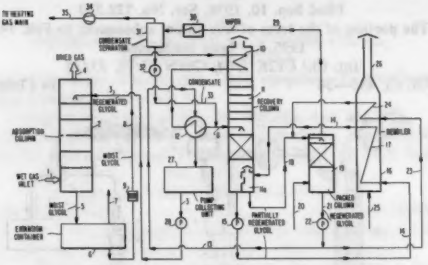
4,182,659

METHOD OF CONCENTRATING A WATER-CONTAINING GLYCOL

Jamil Anwer; Kuldip K. Sud, and Karl Wintrup, all of Cologne, Fed. Rep. of Germany, assignors to Davy International Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 847,410
Int. Cl.[2] C07C 29/26
U.S. Cl. 203—18 **13 Claims**

1. A method of concentrating a water-containing glycol to a glycol concentration of at least about 99 weight percent comprising heating the glycol at atmospheric pressure or at superatmospheric pressure in a first stage of vaporize a major portion of the water from said glycol to thereby partially concentrate the glycol, withdrawing the partially concentrated liquid glycol and a water-containing vapor phase as separate streams from said first stage, further concentrating the partially concentrated liquid glycol in a column forming a second stage by vaporizing water from said glycol at a pressure of less than 1



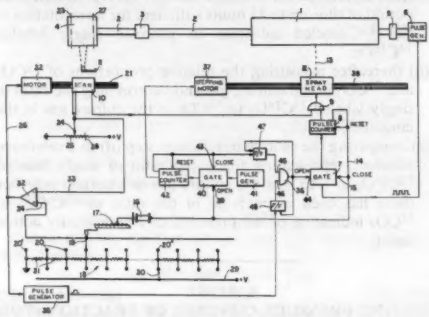
atmosphere while heating said second stage to maintain a temperature therein in the range of about 140° C. to 200° C., and withdrawing as separate streams a concentrated liquid glycol phase containing at least about 99 weight percent glycol and a vaporous mixture containing water vapor from said second stage.

4,182,660

METHOD OF PRODUCING A PERFORATED METAL FOIL

Peter Zimmer; Hans Kudlich, both of Kufstein, and Karl Schweitzer, Oberlangkampfen, all of Austria, assignors to Maschinenfabrik Peter Zimmer Aktiengesellschaft, Kufstein, Austria

Filed Apr. 17, 1978, Ser. No. 897,054
Claims priority, application Austria, Apr. 18, 1977, 2705/69
Int. Cl.[2] C25D 1/08
U.S. Cl. 204—11 **5 Claims**



1. In a method of providing a metal foil with a predetermined pattern of fine perforations by forming a corresponding pattern of tiny dots on a substrate and thereafter covering the interstices between the dots with a coherent electrolytically deposited metallic layer which is subsequently stripped off the substrate,

the improvement wherein the substrate has a cylindrical surface and is provided with the dot pattern by being rotated at constant speed about an axis while a nozzle sweeping across said surface at close distance therefrom and in a relative axial direction is intermittently actuated under the control of signals derived from the concurrent scanning of a master to discharge a hardenable substance in a programmed succession of short spurts onto said substrate.

4,182,661
ELECTROCHEMICAL PRODUCTION OF AVAILABLE CHLORINE CONTAINING ORGANIC COMPOUNDS IN A DIVIDED CELL

Richard W. Lynch, Chattanooga, and Ronald L. Dotson, Cleveland, both of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 31, 1978, Ser. No. 929,092
Int. Cl.[2] C25B *3/02*
U.S. Cl. 204—78 **39 Claims**

1. A process for the preparation of organic hypohalites in an electrolytic cell having an anolyte chamber containing an anode and a catholyte chamber containing a cathode, separated by a separator, which comprises:

(a) charging a mixture of brine and an organic alcohol into said anolyte chamber wherein said organic alcohol is selected from the group consisting of secondary alcohols, tertiary alcohols, and cyclic alcohols;

(b) charging a dilute aqueous caustic solution to said catholyte chamber;

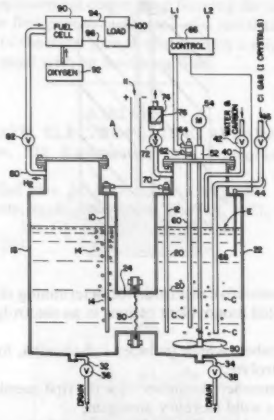
(c) passing an electric current between said anode and said cathode, whereby organic hypohalite is formed in said anolyte chamber; and

(d) recovering said organic hypohalite from said anolyte chamber.

4,182,662
METHOD OF FORMING HYDROGEN

Thomas G. Hart, Royal Oak, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Division of Ser. No. 86,258, Oct. 18, 1979 and a division of Ser. No. 56,915, Jul. 12, 1979. Jul. 19, 1978, Ser. No. 925,980
Filed Jul. 19, 1978, Ser. No. 925,980
Int. Cl.[2] C25B *1/00, 1/02, 1/26*
U.S. Cl. 204—101 **24 Claims**



1. A method of forming hydrogen by electrolysis of a halogen acid solution produced from a reaction process using oxidation of carbon particles as an input energy source in a solution water, said method comprising the steps of:

(a) providing an electrolysis cell with a hydrogen electrode in a hydrogen collection area of said cell and a halogen electrode for producing electrochemically released halogen in a halogen collecting area of said cell;

(b) providing a solution of said halogen acid in said cell, said solution forming a liquid electrolyte with a known total decomposition electrode voltage and electrically connecting said electrodes;

(c) continuously producing said halogen acid electrolyte by dissolving the electrochemically released halogen at the halogen electrode into said halogen acid solution at said halogen collecting area and reacting said dissolved halogen in a reaction area communicated with said halogen collecting area with carbon particles and solution water while said reaction area is at a reaction temperature above ambient temperature, and is agitated to maintain said carbon particles in suspension;

(d) applying a driving voltage across said electrode, said driving voltage being at least said known total decomposition electrode voltage; and,

(e) removing said hydrogen for said hydrogen collecting area of said cell.

4,182,663
CONVERTING OXYGEN TO OZONE BY U.V. RADIATION OF A HALOGEN SATURATED HYDROCARBON LIQUID CONTAINING DISSOLVED OR ABSORBED OXYGEN

Vesper A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033

Filed Mar. 13, 1978, Ser. No. 885,956
Int. Cl.[2] B01J *1/10*; A61L *1/00*
U.S. Cl. 204—157.1 R **10 Claims**

1. A method for the production of ozone within a system which comprises the exciting of oxygen in a liquid environment with ultraviolet light energy comprising the steps of,

injecting a dissolving vessel with an inert, dielectric absorber liquid having an affinity to dissolve oxygen,

mixing gaseous oxygen with the liquid prior to or in the dissolving vessel, under pressure,

passing the oxygen containing liquid through an ultraviolet light sourse,

stripping the ozone from the radiated liquid for use,

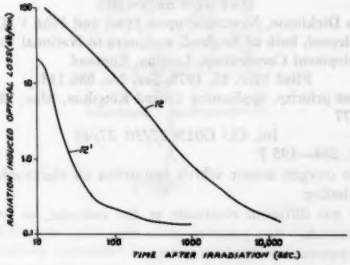
or mixing the liquid, pregnant with ozone with an other liquid containing chemicals which react with ozone,

recycling the ozone stripped liquid for multiple use.

4,182,664
RADIATION HARDNESS OF OPTICAL FIBERS

Mokhtar S. Maklad, Roanoke; George H. Sigel, Jr., Fairfax County, and Gary W. Bickel, Roanoke, all of Va., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jun. 2, 1977, Ser. No. 802,745
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—157.1 H **15 Claims**



1. A method of pretreating an optical fiber to render the fiber less susceptible to radiation induced optical transmission losses that could result from subsequent exposure to nuclear radiation from a second source comprising the step of:

exposing the optical fiber to nuclear radiation from a first source to pretreat the fiber and to render it less susceptible to said subsequent exposure to further nuclear radiation that could result from said second source.

4,182,665
METHOD FOR CURING PHOTO-CURABLE COMPOSITION

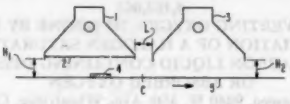
Hiroaki Mibu, Kyoto; Tadashi Ishihara, Osaka; Chiaki Tanaka, and Shingo Esaki, both of Kyoto, all of Japan, assignors to Japan Storage Battery Co., Ltd., Kyoto and Nippon Paint Co., Ltd., Osaka, both of, Japan

Continuation of Ser. No. 777,483, Mar. 14, 1977, abandoned, which is a continuation of Ser. No. 563,991, Apr. 1, 1975, abandoned. This application Sep. 18, 1978, Ser. No. 943,275

Claims priority, application Japan, Apr. 1, 1974, 49-37184; Sep. 25, 1974, 49-110760

Int. Cl.[2] **C08F** *8/00*; **G03C** *5/04*

U.S. Cl. 204—159.15 **20 Claims**



1. A method for curing a photo-curable composition consisting essentially of a resin having a α,β-ethylenically unsaturated bond, a polymerizable monomer and a photosensitizer, said method comprising the sequential steps of:

1. irradiating said photo-curable composition with a light source A emitting radiation predominantly across the range of from about 350 to about 460 nm and substantially no wavelength shorter than 300 nm, for a period of time sufficient to cure the interior portion of said photo-curable composition and then in a second step,
2. irradiating said photo-curable composition with a light source B emitting radiation predominantly across the range of from about 230 to about 400 nm, for a period of time sufficient to cure the surface portion of said photo-curable composition,

with the irradiation intensity ratio E_A/E_B being in the range of from 0.01 to 20 where E_A is the irradiation intensity of light source A for wavelengths in the range of from about 350 to about 460 nm and E_B is the irradiation intensity of light source B for wavelengths in the range of about 230 to about 400 nm on the surface of said photocurable composition.

4,182,666
OXYGEN SENSORS

Thomas Dickinson, Newcastle-upon-Tyne, and John V. Dobson, Hartlepool, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 13, 1978, Ser. No. 886,115

Claims priority, application United Kingdom, Mar. 15, 1977, 10840/77

Int. Cl.[2] **G01N** *27/30, 27/46*

U.S. Cl. 204—195 P **7 Claims**

1. An oxygen sensor which comprises an electrochemical cell including

(a) a gas diffusion electrode as the cathode, or working electrode,

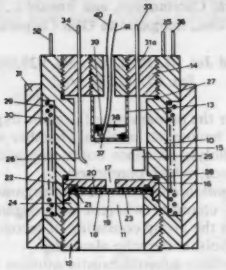
(b) a counter electrode as anode,

(c) a reference electrode, and

(d) a mass of salt which when molten constitutes an electrolyte in contact with said electrodes, the sensor also comprising

(e) means for maintaining the working electrode (a) at a constant potential with reference to the reference electrode, and

(f) means for determining the current flowing in the electrochemical cell due to reduction at the oxygen diffusion electrode (a) of oxygen present in the environment of the oxygen sensor, wherein the counter electrode (b) is a



noble metal and the reference electrode (c) is a noble metal/noble metal oxide electrode.

4,182,667
ION-SENSITIVE ELECTRODES

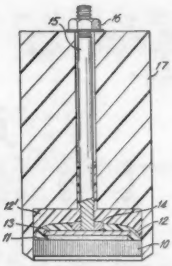
John V. Dobson, Hartlepool, and Thomas Dickinson, Newcastle-upon-Tyne, both of England, assignors to National Research Development Corporation, London, England

Division of Ser. No. 741,494, Nov. 12, 1976, Pat. No. 4,111,777, which is a continuation of Ser. No. 605,881, Aug. 19, 1975, abandoned. This application May 22, 1978, Ser. No. 908,441

Claims priority, application United Kingdom, Sep. 4, 1974, 38748/74

Int. Cl.[2] **G01N** *27/30, 27/58*

U.S. Cl. 204—195 M **2 Claims**



1. An ion-sensitive electrode for determining the concentration of selected monovalent cations in an electrolyte, comprising

a first member, which includes a β-alumina, for contacting an electrolyte,

a second member in contact with the first member and comprising a solid mercury amalgam,

means for making electrical contact with the solid mercury amalgam, and insulating means distinct from the first member, surrounding the second member and the contact means, and construted to form an elongate container shielding both the second member and the contact means from an electrolyte when the electrode is in operation allowing the first member to contact the said electrolyte, the second member being isolated from the electrolyte by being entirely enclosed by an enclosure comprising the insulating means and the first member, and

both the β-alumina and the said solid mercury amalgam containing cations selected from the group consisting of Na, K, Rb, Li, Tl, Ag, Cu, NO, Cs and NH_4,

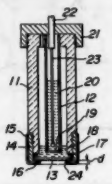
allowing the electrode to be used for determining the concentrartion of said cations in an electrolyte.

4,182,668

ION SELECTIVE ELECTRODE

Kiyozo Koshiishi, Sagamihara, and Takashi Mizusaki, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1978, Ser. No. 950,295
Claims priority, application Japan, Oct. 20, 1977, 52/140936[U]
Int. Cl.[2] G01N 27/30
U.S. Cl. 204—195 L 5 Claims



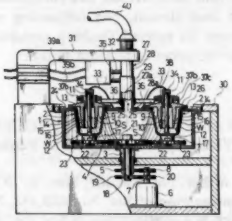
1. An improved ion selective electrode having an outer tubular body having an opening at one end, an inner tubular body secured to the other end of the outer tubular body and having an opening at one end, a tip member threadably engaged to one end of the outer tubular body and having an aperture at one end, a first porous membrane provided between the tip member and one end of the outer tubular body, to define a first reservoir together with the outer tubular body, an ion-exchanger liquid accommodated in the first reservoir and in direct contact with the first porous membrane, an internal reference solution accommodated in the second reservoir, and an inner reference electrode connected to a shielded cable, said shielded cable extending through the other end of the outer tubular body and being dipped in the internal reference solution, the improvement comprising: forming the tip member for holding the first porous membrane of a metal tube and at least a portion of the metal tube in contact with a solution to be tested being coated with an insulating film.

4,182,669

AUTOMATIC ELECTROPLATING APPARATUS

Tetsuya Hojyo, 110 Karasugatsuji-cho, Tennoji-ku, Osaka, Japan

Filed Nov. 24, 1978, Ser. No. 963,180
Claims priority, application Japan, Nov. 28, 1977, 52-143041
Int. Cl.[2] C25D 17/00, 17/16
U.S. Cl. 204—213 35 Claims



1. An automatic electroplating apparatus comprising
at least one power-driven larger rotary drum designed so as to contain a plating solution therein,
at least one power-driven smaller rotary drum disposed in said larger drum,
intercommunication means formed in said smaller drum for permitting said plating solution to interflow between insides of said smaller drum and said larger drum,
a cathode means provided internally of said smaller drum,
an anode means provided internally of said smaller drum in spaced apart relation with said cathode means,
said smaller drum being arranged so as to rotate on its own axis and to orbitally revolve around a vertical axis of said larger drum.

4,182,670

COMBINED CATHODE AND DIAPHRAGM UNIT FOR ELECTROLYTIC CELLS

Shyam D. Argade, Woodhaven, Mich., and Thomas G. Coker, Natick, Mass., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 694,976, Jun. 11, 1976, abandoned, which is a division of Ser. No. 611,030, Sep. 8, 1975, Pat. No. 4,049,841. This application Jul. 17, 1978, Ser. No. 924,895
Int. Cl.[2] C25B 11/03, 11/06, 13/04
U.S. Cl. 204—252 14 Claims

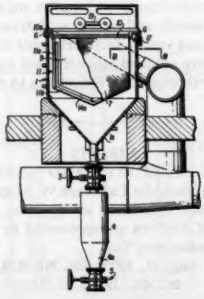
1. In a method for manufacturing a chlor-alkali electrolysis cell having a cathode and a fibrous diaphragm justaposed thereto, the improvement comprising
spray coating a ferrous metal substrate with a powder metal selected from the group consisting of nickel, cobalt, tungstun carbide, and mixtures thereof, to form the cathode with the cathode surface having a larger true surface area than the geometric surface area of the substrate, and
vacuum depositing a slurry containing asbestos fibers and an organic cementing agent onto a spray coated surface of the cathode to form a fibrous diaphragm securely adhered thereto,
said fibrous diaphragm comprising asbestos and from about 10 to about 30 percent based on the weight of asbestos of the organic cementing agent.

4,182,671

ELECTROLYTIC SILVER AND GOLD REFINING CELL

Sergio Squarcialupi, Arezzo, Italy, assignor to Chimet S.p.A., Badia Al Pino, Italy

Filed Apr. 28, 1978, Ser. No. 900,997
Claims priority, application Italy, May 11, 1977, 49357 A/77
Int. Cl.[2] C25C 7/00, 1/20
U.S. Cl. 204—276 9 Claims



1. Electrolytic gold and silver refining cell for extracting gold and silver contained in a material, said cell being part of a plurality of cells arranged in at least one common vessel provided with a solution feeding inlet and an exhausted solution outlet, said cell being also provided with a plate cathode consisting of an acid proof material and a plate anode consisting of said material containing gold and silver and being introduced into filtering bags, said cathode and anode being suspended within the cell arranged in said common vessel, characterized by the fact that:
said common vessel is provided with a hopper bottom having an outlet conduit controlled by a first normally open

valve and connected to another conduit provided at its end with a second normally closed valve; and

each of said filtering bags is provided with a bottom inclined towards its center and containing a pipe that extends along one of its vertical sides and along said inclined bottom to the center thereof.

4,182,672

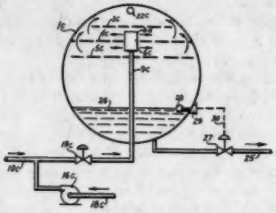
PLURAL STAGE DESALTER/DEHYDRATOR IN A SINGLE VESSEL

Robert B. Martin, Spring, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 784,392, Apr. 4, 1977. This application Jan. 6, 1978, Ser. No. 867,417

Int. Cl.[2] B01D *17/06;* **C10G** *33/02*

U.S. Cl. 204—302 **12 Claims**



1. An apparatus for desalting and/or dehydrating oil-continuous emulsions containing a dispersed aqueous phase, said apparatus comprising a closed vessel which is provided therein with a plurality of coalescing stages, said stages being hydraulically substantially independent to allow parallel stage operation, there being contained within said closed vessel: a plurality of horizontally disposed planar permeable electrodes in vertically spaced relationship, said electrodes being adapted to provide superimposed electric fields to cause coalescing of suspended droplets of the dispersed aqueous phase; distributor means between each pair of adjacent electrodes adapted to cause emulsion to flow between said adjacent electrodes; conduit means for supplying emulsion to said distributor means, said conduit means being common to each of said distributor means; product withdrawal and outlet means in the upper portion of said vessel; and water withdrawal means in the lower portion of said vessel; said permeable electrodes and the vessel interior being adapted and arranged to permit water to pass downwardly through said electrodes to the lower portion of said vessel.

4,182,673

DUST PRECUTTER AND METHOD

Eric W. Schmidt, Columbus; Lawrence W. Miga, Circleville, and James A. Gieseke, Columbus, all of Ohio, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 31, 1978, Ser. No. 938,593

Int. Cl.[2] B07B *13/11*

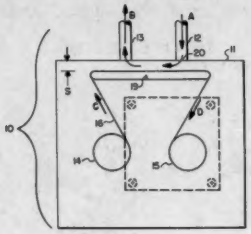
U.S. Cl. 209—45 **5 Claims**

3. A method of discriminately removing particles larger than a preselected given size from a particle-laden fluid stream which method comprises:

(a) directing the moving particle-laden stream from an orifice in a substantially perpendicular direction towards a moving collector surface facing the orifice and adapted to collect and retain particles impinging thereon;

(b) moving the collector surface past the direction of substantial perpendicular movement thereto of the particle-laden fluid stream with the moving collector surface spaced from the orifice at a distance optimizing through inertial force a discriminate impingement of said particles larger than the preselected given size onto the moving collector surface;

(c) flowing a remainder of the moving particle-laden stream along and substantially parallel to the moving collector surface; and



(d) thereafter flowing the remainder of the moving particle-laden fluid stream substantially perpendicular and away from the moving collector surface, thereby exiting said remainder of said moving particle-laden fluid stream.

4,182,674

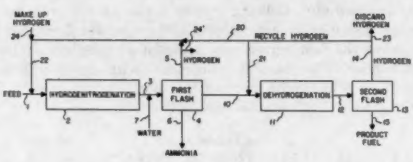
NITROGEN REDUCTION AND DEHYDROGENATION OF SYNTHETIC CRUDE

Donald K. Wunderlich, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 28, 1979, Ser. No. 16,452

Int. Cl.[2] C10G *23/00;* **C07C** *5/32*

U.S. Cl. 208—89 **5 Claims**



1. A method for reducing the nitrogen content of a liquid feed stream derived from at least one of oil shale and coal comprising hydrodenitrogenating said feed stream, subjecting said hydrodenitrogenated feed stream to first flashing conditions to separate primarily hydrogen, hydrogen sulfide, and ammonia from said feed stream, dehydrogenating the flashed denitrogenated feed stream, and subjecting said dehydrogenated feed stream to second flashing conditions to separate hydrogen from the process product liquid.

4,182,675

WASTE TREATMENT PROCESS

John S. Jeris, Yonkers, N.Y., assignor to Ecolotrol, Inc., Bethpage, N.Y.

Continuation of Ser. No. 738,867, Nov. 4, 1976, abandoned, which is a continuation of Ser. No. 633,153, Nov. 18, 1975, abandoned, which is a continuation of Ser. No. 487,974, Jul. 12, 1974, abandoned. This application Jun. 20, 1978, Ser. No. 917,162

Int. Cl.[2] C02C *1/04*

U.S. Cl. 210—8 **11 Claims**

1. A biological process for removing biochemical oxygen demand from waste water, which comprises:

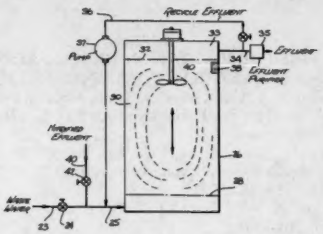
forming a fluidized bed of acid forming, including methane forming, microorganisms attached to a solid particulate carrier,

continuously passing waste water consisting essentially of

biochemical oxygen demand to be treated through said fluidized bed,

retaining said waste water in said fluidized bed for a sufficient period of time while maintaining said fluidized bed at a sufficient temperature and while maintaining said fluidized bed under substantially anaerobic conditions to biologically convert substantially all of the biochemical oxygen demand to be removed from the waste water to methane gas, carbon dioxide and cellular material; and

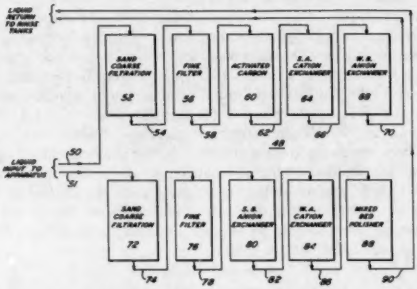
continuously withdrawing said methane gas and carbon dioxide from said fluidized bed, and removing excess cellular material from said particulate carrier to leave a thin layer of said microorganisms on said particulate carrier.



4,182,676
METHOD AND SYSTEM FOR PURIFYING LIQUID

Angelo J. Casolo, Columbia, Md., assignor to Almag Chemical Corp., Baltimore, Md.

Division of Ser. No. 483,801, Jun. 27, 1974, Pat. No. 3,985,648. This application Aug. 3, 1976, Ser. No. 711,363
The portion of the term of this patent subsequent to Oct. 12, 1993, has been disclaimed.
Int. Cl.² C02B *1/42, 1/56*
U.S. Cl. 210—27 **10 Claims**



1. A method of purifying mineral contaminated water, said water including mineral contaminants of copper, cadmium, chromium (Cr^{+6}), iron, cyanide, and phosphate, including the steps of:

(a) dividing said mineral contaminated water from a storage tank into a first stream and a second stream;

(b) transporting said first stream through a first plurality of ion exchange resins connected in series flow each to the other including series passage through a strong acid cation exchange resin in the hydrogen form to provide an efflux having a pH value within the range of 1.0 and 5.0, and a weak base anion exchange resin in the hydroxyl form to provide an efflux having a pH value within the range of 7.0 and 10.0,

(c) simultaneously passing said second stream through a second plurality of ion exchange resins coupled each to the other in series flow including consecutive series flow through a strong base anion exchange resin in the hydroxyl form to provide an efflux pH value within the range of 7.0–10.0, and a weak acid cation exchange resin in the hydrogen form to provide an efflux having a pH value within the range of 3.0–7.0; and

(d) combining liquid efflux of said first and second plurality of ion exchange resins for return to said storage tank.

4,182,677
MODIFIED RUBBER, ITS USE AS HYDROCARBON ABSORBER

Christian Bocard, Orgeval; Philippe Renault, Noisy le Roi; Henri Seris, Rueil Malmaison, and Claude Gatellier, Boulogne, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

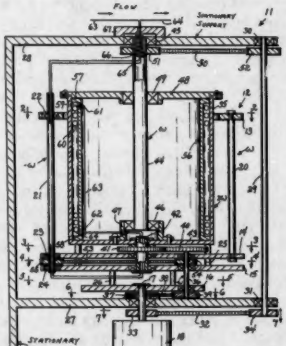
Continuation-in-part of Ser. No. 671,712, Mar. 29, 1976, abandoned. This application Sep. 23, 1977, Ser. No. 836,252
Claims priority, application France, Apr. 3, 1975, 75 10993; Jan. 28, 1976, 76 02507
Int. Cl.² C02B *9/02*
U.S. Cl. 210—36 **26 Claims**

1. A process for absorbing a hydrocarbon or an organic solvent, which process comprises contacting said hydrocarbon or solvent with an absorption mass consisting essentially of rubber particles previously subjected to a process of treating said rubber particles with a solution or dispersion consisting essentially of an acid, with the additional condition that, when the acid is sulfuric acid, non-sulfonating conditions are used for said treatment, said solution or dispersion being of sufficient acidity and said treatment being conducted for a sufficient time to yield a resultant rubber having a larger capacity for absorbing hydrocarbon or an organic solvent than untreated rubber.

4,182,678
MICRO-SCALE COUNTERCURRENT CHROMATOGRAPH

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Department of Health, Education & Welfare, Washington, D.C.

Filed Dec. 14, 1978, Ser. No. 969,570
Int. Cl.² B01D *15/08*
U.S. Cl. 210—198 C **13 Claims**



1. A flow-through coil planet centrifuge apparatus comprising stationary support means, stationary drive motor means having a vertical output shaft, a rotor frame coaxially drivingly mounted on said vertical output shaft, a bowl member coaxially positioned in said rotor frame and having a tubular bottom

axial shaft, means supportingly rotatably axially connecting said bottom axial shaft to said rotor frame, vertical depending hollow shaft means journalled in said stationary support means above the bowl member, means axially rotatably and supportingly connecting said depending shaft means to said bowl member, a coiled separation column coaxially mounted on and coiled around the periphery of said bowl member, said column having inlet and outlet flow tubes extending downwardly through said tubular bottom axial shaft and upwardly through said depending hollow shaft means, planet gearing means drivingly intercoupling said tubular bottom axial shaft, rotor frame and stationary support means to drive said bowl member responsive to rotation of said rotor frame, and means drivingly intercoupling said vertical output shaft and depending hollow shaft means so as to avoid twisting of said flow tubes during rotation of said bowl member relative to said stationary support means.

4,182,679

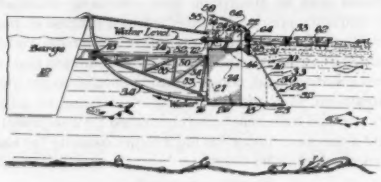
OIL SKIMMER

Paul Van Hekle, Newark, Del., assignor to Ralph Watts

Filed Jun. 20, 1978, Ser. No. 917,155

Int. Cl.[2] E02B *15/04*

U.S. Cl. 210—242 S **19 Claims**



1. An oil skimming module for mounting on the bow of a vessel for separating oil or the like floating on water from the water comprising a separator tank having a top section connected to and communicating with a bottom section therebeneath, said top section being divided into an inlet chamber for receiving a mixture of oil floating on the water and an oil chamber for receiving the separated oil, containing means mounted to said separator tank for directing the mixture into said inlet chamber, said inlet chamber having a front wall and a back wall opposite therefrom and a bottom wall connected therebetween, said front wall having an opening to permit the mixture to pass into said inlet chamber formed by said walls, said back wall of said inlet chamber and said bottom wall forming a generally L-shaped baffle, said back wall of said inlet chamber having surface irregularities to minimize turbulence from the mixture entering said inlet chamber, the lower portion of said L-shaped baffle being perforate to permit the mixture to pass therethrough into said bottom section, the external walls of said bottom section of said tank defining a storage section for the mixture passing therein, said external walls of said bottom section including a bottom wall and a front wall and a rear wall and a pair of side walls, said side walls of said bottom section converging from said bottom wall upwardly toward each other and being connected to the lower edge of said top section at the juncture of said top section and said bottom section, said front wall of said bottom section comprising a pair of panels converging from said bottom wall upwardly toward each other and toward said lower edge of said top section, each of said panels having an adjacent edge and a remote edge, said adjacent edges of said panels being joined together to form an upwardly and backwardly directed pointed front leading edge for said tank, each of said remote edges of said panels being connected to its adjacent side wall of said bottom section, the horizontal cross-sectional area of said storage section of said tank increasing with the distance away from said inlet chamber toward said bottom wall of said bottom section and said tank thereby having increasing capacity away from said inlet chamber toward said bottom wall of said bottom section, said oil chamber in said separator tank being above and in flow communication with said storage section and in back of said inlet chamber, said back wall of said inlet chamber comprising the front wall of said oil chamber, oil pump means communicating with said oil chamber for withdrawing oil therefrom, and water pump means communicating with said storage section for controlling the level of water therein.

4,182,680

DEVICE FOR FILTRATION UNDER PRESSURE OF SOLID PARTICLES CONTAINED IN LIQUIDS

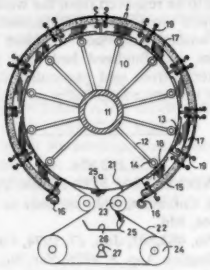
Jean-Claude A. Carle, Viry Noureuil, France, assignor to Societe Anonyme des Fonderies et Ateliers L. CHOQUENET, Chauny, France

Filed Jun. 19, 1978, Ser. No. 916,550

Claims priority, application France, Jun. 22, 1977, 77 19110; May 25, 1978, 78 15532

Int. Cl.[2] B01D *33/08*

U.S. Cl. 210—386 **16 Claims**



1. Filtration device including the combined assembly of a drum equipped with radial feed pipes for the charged liquid to be filtered, originating at a tight control valve on the drum's mounting shaft terminating at openings in the drum surface, in the proximity of which valves are installed; a filter cloth enveloping an initial segment of the drum and spaced from a second, complementary segment as it follows a looped path passing over countershafts; and a chain of compartmented elements surrounding at least said initial drum segment, which segment is also enveloped by means for tight application of said filter cloth and said compartmented elements against said drum, which means are placed in action during the intervals of open-valve admission of the charged liquid while the drum, chain and cloth are immobile, and released upon the closing of said valves while at least the drum and cloth are set in motion causing them to pass by at least a station for scraping off the solid residue of filtrate cake.

4,182,681

FIRE-RETARDANT AGENT FOR TREATING CELLULOSE INSULATION, METHOD OF PREPARING THE AGENT, AND METHOD OF FABRICATING FIRE-RETARDANT CELLULOSE INSULATION

Daniel L. Gumbert, 4904 Tristam Ct., Fort Wayne, Ind. 46815

Filed Jul. 10, 1978, Ser. No. 922,812

Int. Cl.[2] C09K *3/28*

U.S. Cl. 252—8.1 **9 Claims**

1. A fire-retarding agent for impregnating cellulose insulation comprising a composite of borax, ammonium sulphate, aluminum sulphate, soda ash, anhydrous silica gel and diammonium phosphate physically intermixed while excluding ambient air in proportions as provide a ph of about 7.5 to about 8.3 with the borax at about a ph of 9 and soda ash at about 10 to about 14, silica gel in an amount that moisturizes the composite

in the range of about 0%-6% by volume, diammonium phosphate in an amount that minimizes development of smoke by the aluminum sulphate, ammonium sulphate in an amount that minimizes the development of smoke, aluminum sulphate in an amount to enhance the fire-retarding properties of the agent, such proportions and amounts further being such that cellulose insulation impregnated with twenty percent by weight of composite meets the test requirements of ASTM C739-73 for Class I materials.

7. The method of fabricating insulation of raw paper cellulose and dry chemical agent wherein said agent has a ph of from about 7.5 to 8.3 and a moisture content by volume of from about 0 to 6 percent, said agent including predetermined amounts of borax, ammonium sulphate, aluminum sulphate, soda ash, anhydrous silica gel and diammonium phosphate which, when combined with said cellulose produces an insulation which meets the test requirements of ASTM C739-73 for Class I materials, comprising the steps of dry mixing twenty percent by weight of agent and raw cellulose in a hammermill for a period of time as required for the agent to impregnate said cellulose, said mixing being performed while excluding ambient air and producing heat of friction to a temperature in the range of from about 140° F. to about 240° F. which vaporizes residual moisture in said agent, said vapor aiding in the agent's impregnation of said cellulose.

4,182,682

PREPARATION FOR SHRINKPROOFING WOOL AND PROCESS FOR THE PRODUCTION OF THE PREPARATION

Götz Koerner, Kantorie 126; Günter Schmidt, Ahornstrasse 47, and Friedhelm Nickel, Lortzingstrasse 10, all of 4330 Essen, Fed. Rep. of Germany

Filed Dec. 12, 1978, Ser. No. 968,766

Claims priority, application United Kingdom, Dec. 22, 1977, 53571/77

Int. Cl.[2] D06M *13/10*

U.S. Cl. 252—8.6 **12 Claims**

1. A composition for shrinkproofing wool consisting essentially of

(a) 1 to 50 weight % of organopolysiloxanes containing mercaptoalkyl or mercaptoaryl groups which are formed from

(aa) 90 to 99.9 mole% of units having the formula

$$R_nSiO_{(4-n)/2}$$

in which

R is a methyl residue, up to 10 mole% of may be replaced by alkyl residues with a chain length greater than methyl or by aryl residues and up to 5 mole% of which may be replaced by mercaptoalkyl or mercaptoaryl residues,

n has a value of 1.8 to 2.0 and

(ab) 0.1 to 10 mole% of units having the formula

$$R'SiO_{3/2}$$

in which R' is an alkyl residue, a mercaptoalkyl or mercaptoaryl residue, $O_{0.5}$ or a hydrogen residue;

wherein the organopolysiloxane contains 10 to 1000 silicon atoms per mercaptoalkyl or mercaptoaryl group, and up to 10 mole% of the oxygen atoms attached to silicon may be replaced by two OR'' groups, in which R'' represents a lower alkyl residue or a hydrogen residue, and

(b) 50 to 99 weight% water, emulsifiers, organic solvents.

4,182,683

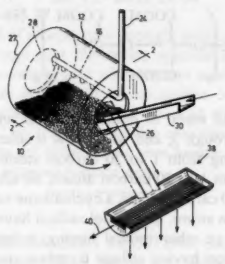
PROCESS FOR THE MANUFACTURE OF A DISHWASHING DETERGENT

John K. Irvine; Michael D. Mitchell, and Gunter H. Berk, all of Conn Chem Limited, 13 Bethridge Rd., Rexdale, Ontario, Canada

Continuation-in-part of Ser. No. 687,037, May 17, 1976, abandoned. This application Apr. 17, 1978, Ser. No. 897,199

Int. Cl.[2] C11D *11/00, 7/56*

U.S. Cl. 252—99 **10 Claims**



1. A process for manufacturing in a single mixing vessel a free-flowing granular dishwasher detergent of typical components including hydrated forms of sodium tripolyphosphate, a silicate selected from the group consisting of sodium silicate, potassium silicate and mixtures thereof having a weight ratio of SiO_2 to Na_2O or K_2O between approximately 2.4:1 and approximately 3.25:1, chlorinated trisodium phosphates, a non-ionic surfactant and their chemical equivalents; said process comprising the steps of:

(i) mixing in a ventilated mixing vessel, a dry mixture of 30 to 45% by weight of sodium tripolyphosphate and 20 to 30% by weight of chlorinated trisodium phosphate, the ratio of the volume of said dry mixture and the volume of said vessel being between about 1:25 to 1:8;

(ii) spraying approximately 15 to 30% by weight of an aqueous solution of selected silicate at ambient temperature onto said dry mixture while continuing the mixing to form an agglomerate of the dry mixture during hydration of said sodium tripolyphosphate;

(iii) spraying onto the formed agglomerate, 1.5 to 6% by weight of the non-ionic surfactant at ambient temperature while continuing the mixing of the formed agglomerate;

(iv) coating the treated agglomerate while continuing its mixing by spraying onto it, a further 10 to 25% by weight of an aqueous solution of selected silicate at ambient temperature to make up a total of 25 to 40% by weight of silicate used;

(v) mixing the coated agglomerate in the vessel to ventilate it to the air of the vessel while discharging the coated agglomerate from such vessel;

said ratio of volumes and the ventillation of such mixing vessel maintaining the mixture temperature in a range at which said chlorinated trisodium phosphate is relatively stable to retain available chlorine in the formed agglomerate, the silicate coating of the formed agglomerate inhibiting chlorine loss from the dishwasher detergent over extended periods of shelf-life.

4,182,684
MACHINE DISHWASHING COMPOSITION

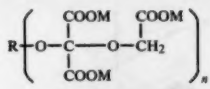
Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 830,249, Sep. 2, 1977, abandoned, which is a division of Ser. No. 670,336, Mar. 25, 1976, Pat. No. 4,118,420, which is a continuation of Ser. No. 471,088, May 17, 1974, abandoned. This application Nov. 17, 1978, Ser. No. 961,594

Int. Cl.[2] C11D *7/54*

U.S. Cl. 252—99 **6 Claims**

1. A machine dishwashing composition comprising (a) from 5 to 90 percent by weight of a compound corresponding to the formula



wherein M is alkali metal or ammonium and wherein n is a number from 1 through 3, and wherein R is selected from an alkyl radical having from 1 to 20 carbon atoms, an alkenyl radical having from 1 to 20 carbon atoms, an alkynyl radical having from 1 to 20 carbon atoms, a cycloalkane radical having from 3 to 20 carbon atoms, an alkanol radical having from 2 to 20 carbon atoms, an ether radical having at least 3 carbon atoms, an aryl radical having at least 6 carbon atoms, a substituted aryl radical having at least 6 carbon atoms wherein the substituents are halogen, nitro, amide or carboxyalkyl substituents, aralkyl radicals having at least 7 carbon atoms and arylether radicals having at least 7 carbon atoms, and (b) from 0 to 5 percent by weight of a surfactant selected from the group consisting of low-foaming anionic and nonionic surfactants and mixtures thereof, (c) a chlorine-providing material selected from the group consisting of potassium dichlorocyanurate; sodium dichlorocyanurate; [(monotrichloro)tetra-(monopotassium dichloro)] penta-isocyanurate; (monotrichloro) (monopotassium dichloro) diisocyanurate; chlorinated trisodium phosphate, said chlorine-providing material being present in an amount sufficient to provide from 0.5% to 2% by weight available chlorine, and (d) from 5% to 30% by weight soluble sodium silicate having an SiO_2 to Na_2O mole ratio of from 1:1 to 3.2:1.

4,182,685
METHOD OF PREPARING METAL-CONTAINING SOAP AND SOAP SO PRODUCED

George G. Merkl, 46 Sunset Ct., Haworth, N.J. 07651

Continuation-in-part of Ser. No. 534,084, Dec. 23, 1974, abandoned. This application Jan. 10, 1977, Ser. No. 758,346

Int. Cl.[2] C11D *9/38, 13/00*

U.S. Cl. 252—117 **9 Claims**

1. A method of preparing a metal-containing soap which comprises:

mixing at a temperature of at least about 105° F.

(a) an aqueous solution of a water-soluble, multi-metal, inorganic, amide group-containing monomeric or polymeric complex prepared by reacting at least one non-alkaline metal, ammonia, and an alkali metal hydroxide, in an aqueous medium, in such manner as to form amide groups; and

(b) a fatty acid

whereby said fatty acid (b) reacts with said inorganic complex (a) upon mixing, and said soap forms in the reaction system.

4,182,686
PLASTIC WAX CLEANING AND POLISHING COMPOSITION AND METHOD OF MAKING SAME

Sid Laks, Denver, and Thomas S. Evans, Wheatridge, both of Colo., assignors to Sid Laks, Denver, Colo.

Filed May 17, 1978, Ser. No. 906,733

Int. Cl.[2] C11D *9/30*

U.S. Cl. 252—119 **13 Claims**

1. A cleaning and polishing composition for plastic surfaces and the like comprising an intermixture of:

an oil phase containing an intermixture of major proportions by weight of a stearic acid and an abrasive agent and minor proportions by weight of a glycerylmonostearate and cetyl alcohol;

a water phase containing an intermixture of a major proportion of water combined with a minor proportion by weight of an alkanolamine selected from the group consisting of diethanolamine and triethanolamine and a minor proportion by weight of a acrylic filler; and

the resultant oil phase and water phase forming an emulsion with said abrasive agent and said filler in suspension therein.

4,182,687
LIQUID-WATER DISPLACEMENT COMPOSITION

Philip L. Bartlett, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 8, 1977, Ser. No. 858,662

Int. Cl.[2] C09K *3/18*

U.S. Cl. 252—194 **5 Claims**

1. Liquid-water displacement composition consisting essentially of a normally liquid chlorofluorocarbon having at least two carbon atoms, a boiling point of at least about 28° C., a density of at least about 1.3 grams/cc at 20° C. and a solubility parameter of less than about 8 and such an amount of surfactant dissolved therein as to impart water displacement characteristics to the composition, said surfactant being a tetraalkyl ammonium compound in which its cationic moiety is of the formula

$$R_mN^+R_n'$$

wherein

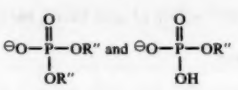
m is 2,

n is 2,

R is C_{8-18} alkyl and

R′ is C_{1-2} alkyl,

and in which the anionic moiety is a 60/40-40/60, by weight, mixture of



wherein R″ is C_{8-18} alkyl.

4,182,688
GAS-ADSORBENT PROPELLANT SYSTEM

Justin J. Murtaugh, Guilford, Ind., assignor to The Drackett Company, Cincinnati, Ohio

Filed Jul. 21, 1976, Ser. No. 707,171

Int. Cl.[2] C09K *3/30*

U.S. Cl. 252—305 **7 Claims**

1. A propellant system comprising an aerosol-type container having a dispensing valve and containing a composition consisting essentially of a gas adsorbed on an adsorbent substrate at super-atmospheric pressure in sufficient quantity such that upon actuation of the dispensing valve, said substrate will desorb a portion of the adsorbed gas to permit discharge of the gas portion from the container at a pressure greater than atmospheric, wherein said gas does not contain any halogen atoms in its molecular structure wherein the initial pressure within

the container is about 100 pounds per square inch gauge, and the substrate is capable of desorbing at least 5 grams of the gas per 100 grams of substrate for discharge from the container upon actuation of the dispensing valave and:

(a) said gas is a member of the group consisting of carbon dioxide, nitrous oxide and mixtures thereof; and

(b) said adsorbent substrate is a member of the group consisting of:

(1) activated carbon;

(2) silica gel;

(3) molecular sieve materials having the general formula

$$Na_2O.Al_2O_3.(SiO_2)_x.(H_2O)_y$$

wherein x varies from 2 to 3, and y varies from 6.1 to 8.0.

4,182,689

TREATMENT OF OIL-IN-WATER EMULSIONS

C. Travis Presley, and Rebecca J. Harrison, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 820,987, Aug. 1, 1977, abandoned. This application Apr. 7, 1978, Ser. No. 894,318

Int. Cl.[2] B01D *17/04*

U.S. Cl. 252—330 11 Claims

1. The process of separating crude oil from "oil-in-water" emulsions containing water-soluble polymer, which process includes the steps of: adding to the emulsion amphoteric metal cations selected from the group consisting of aluminum, chromium, tin and zinc in water-soluble form and treating the resulting flocculate with a strong base.

4,182,690

EMULSION BREAKING MATERIAL

Hideaki Suzuki; Tomoyoshi Ono, both of Iwakuni; Wataru Yamamoto, Hiroshima, and Masahiro Yamaguchi, Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 11, 1977, Ser. No. 850,517

Claims priority, application Japan, Nov. 16, 1976, 51-136939; Jun. 16, 1977, 52-70441; Aug. 19, 1977, 52-98717

Int. Cl.[2] B01D *17/04*

U.S. Cl. 252—358 16 Claims

1. An emulsion breaking material comprising a substrate and one or more water-insoluble organic compounds physically bound thereto without chemical bonding composed of (A) a hydrophobic part consisting of hydrocarbon groups having a total carbon number of 6 to 60 and (B) a hydrophilic part consisting of at least one functional group selected from the group consisting of amine, imino, sulfonamido, hydrazido, thiourea residue, thiol residue, hydroxyl, carboxyl and urethane.

4,182,691

TITANIUM TRICHLORIDE CATALYST AND PROCESS FOR THE PRODUCTION THEREOF

Hiroshi Ueno, Namekawa; Naomi Inaba, Ooi; Tukuo Makishima, Kawagoe; Koh Watanabe, Kunitachi, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 774,764, Mar. 7, 1977, abandoned. This application Feb. 9, 1979, Ser. No. 10,670

Claims priority, application Japan, Mar. 8, 1976, 51-24121

Int. Cl.[2] C08F *4/64*

U.S. Cl. 252—429 B 36 Claims

1. A process for the production of a titanium trichloride catalyst comprising:

reducing titanium tetrachloride with an organo metal compound of the formula R_nAlX_{3-n} wherein R is an alkyl or aryl group having 1 to 18 carbon atoms, X is a halogen atom, and n is a numeral within the range of $1 \leqq n \leqq 3$, at a temperature of from about −50° to about +30° C. to produce a reduced solids product;

contacting said reduced solids product with a chlorinated saturated hydrocarbon having 2 carbon atoms in the presence of a complexing agent selected from an aliphatic ether compound having 4 to 16 carbon atoms at an elevated temperature of about 60° C. to about 100° C. for about 1 to about 10 hours; and

recovering the resulting treated reduced solids product as a titanium trichloride catalyst.

4,182,692

MORDENITE CATALYST

Joseph R. Kiovsky, Kent, and William J. Goyette, Brimfield, both of Ohio, assignors to Norton Company, Worcester, Mass.

Continuation of Ser. No. 825,979, Aug. 19, 1977, abandoned, which is a continuation of Ser. No. 421,505, Dec. 3, 1973, abandoned. This application Jun. 8, 1978, Ser. No. 913,812

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z 3 Claims

1. A method of producing a strongly acidic catalyst comprising treating large port mordenite synthesized in the sodium form with ammonium ions whereby not more than 5% of the original sodium is retained in the zeolite, subsequently acid treating the zeolite whereby the silica to alumina ratio is no higher than 17 to 1 and the zeolite contains from 0.38 to 0.8 milliequivalents per gram of acid sites having a strength at least equal to 48% aqueous sulfuric acid.

4,182,693

HYDROCARBON TREATING CATALYST

Elroy M. Gladrow, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 746,188, Nov. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 626,225, Oct. 28, 1975, abandoned. This application Aug. 25, 1978, Ser. No. 936,804

The portion of the term of this patent subsequent to Apr. 24, 1996, has been disclaimed.

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z 16 Claims

1. A catalyst comprising:

(a) particles of a crystalline aluminosilicate zeolite;

(b) particles of a substantially catalytically inert inorganic oxide having a size of less than about 10 microns in diameter, and

(c) a catalytic inorganic oxide matrix, said inert inorganic oxide having initially a surface area greater than 200 square meters per gram and having at least 0.2 cubic centimeter of its pore volume in pores having diameters ranging from about 90 to about 200 Angstroms.

7. The catalyst of claim 1 wherein said substantially inert inorganic oxide is selected from the group consisting of alumina, silica, titania, zirconia, magnesia and mixtures thereof.

4,182,694

RUTHENIUM-CONTAINING PEROVSKITE CATALYSTS

Alan Lauder, Newark, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 692,500, Jun. 3, 1976, Pat. No. 4,110,254, which is a continuation-in-part of Ser. No. 463,985, Apr. 25, 1974, abandoned. This application Aug. 25, 1978, Ser. No. 936,745

Int. Cl.[2] B01J *23/10, 23/40, 23/72, 23/74*

U.S. Cl. 252—462 13 Claims

1. A catalytic composition having the perovskite-type, ABO_3, crystal structure wherein the Type A cation sites are substantially fully occupied by ions of one metal having an atomic number of 11 to 51, 57 to 71, or 89 to 103; the Type B cation sites are occupied by ions of at least two platinum group metals selected from ruthenium and at least one of osmium, rhodium, iridium, palladium and platinum, wherein ruthenium occupies up to about 10% of the Type B cation sites, with the total platinum group metal ions occupying about 1% to 20% of the Type B cation sites; the remainder of the Type B cation

sites are occupied by ions of at least one nonplatinum group metal having an ionic radius between 0.4 to 1.4 Angstroms.

4,182,695

POLYAMIDE-FIXED BIOLOGICALLY ACTIVE PROTEIN

Jürgen Horn, Langen; Winfried Albert, Pähl; Hans-Georg Batz, and Michael Neiböck-Hochstetter, both of Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Waldhof, Fed. Rep. of Germany

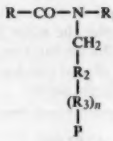
Filed Feb. 16, 1978, Ser. No. 878,545

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2708018

Int. Cl.[2] **A61K** *31/765, 31/775;* **C08G** *69/50*

U.S. Cl. 260—6 **26 Claims**

1. Biologically active protein composition comprising protein or a protein substrate bound onto a polyamide, of the formula



in which

R and R_1, which may be the same or different, are polyamide residues bound onto the amido group,

R_2 is the residue of a compound which can be condensed with formaldehyde and which contains at least one further reactive group,

R_3 is the residue of a bi- or poly-functional protein reagent,

n is 0 or 1, and

P is a biologically active protein

wherein said composition is obtained by the reaction of polyamide with equal moles of formaldehyde and a compound which can be condensed with formaldehyde in a solvent for polyamides, and reacting the resulting product with a bi- or poly-functional protein reagent selected from dialdehydes, dihydroxysuccinimide esters, diacetals, bis-maleinimides, bifunctional imino esters, diepoxides and dicarboxylic acid chlorides, and then coupling the resulting product with a biologically active protein or protein substrate.

4,182,696

PROCESS FOR PRODUCING PARTICULATE FILLER-CONTAINING RESOLE MOLDING COMPOSITIONS FROM AQUEOUS DISPERSION

John Wynstra, Somerville, and Sidney J. Schultz, Cranford, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,287

Int. Cl.[2] **C08L** *1/02*

U.S. Cl. 260—17.2 **36 Claims**

1. A process for producing particulate solid, heat-reactive, substantially water-insoluble resole molding compositions which process comprises the steps of:

(a) reacting formaldehyde, a phenol, and an effective amount of an amine compound selected from the group consisting of hexamethylenetetramine, a compound containing amino hydrogen, and mixtures thereof, in an aqueous medium containing a substantially water-insoluble filler material having reactive sites on the surface thereof which chemically bond with a phenolic resin in an amount sufficient to provide a molding composition with at least about 5 weight percent of said filler and an effective amount of a protective colloid that exhibits protective colloid properties, for a period of time and at a temperature sufficient to produce an aqueous dispersion of a particulate solid, heat-reactive, substantially water-insoluble, thermosetting resole molding composition which has been advanced to the desired stage; and

(b) recovering said resole from said aqueous dispersion.

4,182,697

PROCESS FOR THE PREPARATION OF BORON-CONTAINING PHENOL-FORMALDEHYDE RESINS

Manfred Schmidt; Dieter Freitag, both of Krefeld; Hermann Fries, Bergisch-Gladbach, and Erich Esch, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 2, 1979, Ser. No. 9,121

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1978, 2805180

Int. Cl.[2] **C08G** *8/30, 8/32*

U.S. Cl. 260—19 R **6 Claims**

1. In the process for preparing a boron-containing phenol/formaldehyde resin by reacting a diphenylol alkane novolak with an unsaturated fatty acid or unsaturated fatty acid ester and a boron compound, the improvement comprising reacting a diphenylol alkane novolak having a molecular weight of from 400 to 1600 with from 15 to 35 parts by weight of an unsaturated fatty acid or unsaturated fatty acid ester while azeotropically removing water and then reacting resulting product with a boron compound selected from the group consisting of

(a) from 20 to 100 parts by weight of a boric acid trialkyl ester having from 1 to 4 carbon atoms in each alkyl moiety,

(b) from 14 to 72 parts by weight of a boric acid alkyl ester anhydride of the formula $(RO)_2B—O—B(OR)_2$ wherein R is alkyl having 1 to 4 carbon atoms,

(c) from 10 to 50 parts by weight of boron trioxide and

(d) from 18 to 90 parts by weight of boric acid in the presence of an alkanol having 1 to 4 carbon atoms.

4,182,698

HEAT STABILIZED POLYVINYL CHLORIDE DISPERSION RESINS

Ronald M. Ellis, Pottstown, Pa., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 3, 1978, Ser. No. 902,467

Int. Cl.[2] **C08F** *114/06;* **C08K** *5/16, 5/21, 5/31*

U.S. Cl. 260—23 XA **6 Claims**

1. Polyvinyl chloride dispersion resin heat stabilized with from about 0.1 phr to about 3.0 phr of a water soluble and non-toxic heat stabilizing composition consisting essentially of from about 0.1 phr to about 1.0 phr, as crystalline solid, water soluble, nitrogen containing organic compound, urea, thiourea, dicyandiamide, guanidine salts, and, their water soluble condensation polymers with formaldehyde, in combination with from about 0.1 phr to about 1.0 phr of at least one water soluble organic salt of calcium or zinc.

4,182,699

AQUEOUS MICROEMULSIONS OF VINYL RESINS HAVING CARBOXYLIC OR SULFONIC GROUPS

You-Ling Fan, East Brunswick, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 846,541, Oct. 28, 1977, abandoned. This application Dec. 28, 1977, Ser. No. 865,126

Int. Cl.[2] **C08L** *27/06*

U.S. Cl. 260—29.6 PM **21 Claims**

1. Method of preparing aqueous microemulsions of vinyl resins having carboxylic or sulfonic groups therein which comprises vigorously blending said resins with a water-miscible base, water, at least one organic water-miscible solvent which has an affinity for said resins and a boiling point below about 160° C., and an organic, water-miscible co-solvent which is a poor solvent for said resins but is miscible with the organic

solvent and has a boiling point above that of the organic solvents and water.

4,182,700

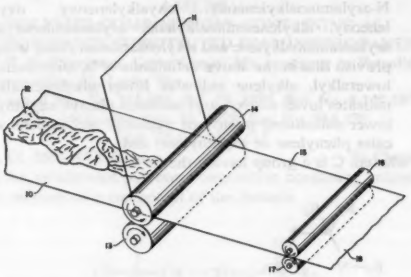
ELASTOMERIC POLYURETHANE FILM CONTAINING DISPERSED DISCRETE AGGREGATES OF LIQUID CRYSTAL AND METHOD OF MAKING THE SAME

William J. Benton, 1046 Murray Hill Ave., and Joseph R. Quigley, 6611 Ridgeville St., all of Pittsburgh, Pa. 15217

Continuation-in-part of Ser. No. 706,962, Jul. 20, 1976, abandoned. This application Jun. 14, 1978, Ser. No. 915,556

Int. Cl.[2] C09K *3/34*

U.S. Cl. 260—37 N **9 Claims**



1. A method for producing polyurethane film articles having discrete particles of liquid crystals dispersed therein comprising:

preparing a polymerizing mixture of organic polyisocyanate; organic polyol having reactive hydrogen as determined by the Zerewitinoff test; a catalyst for the reaction of isocyanate radicals and the radicals containing reactive hydrogen; and at least 5 percent by weight dispersed liquid crystal;

forming said polymerization mixture into a shape; and

after the said polymerizing mixture has been partially cured but not fully cured, changing the shape of the mixture so as to introduce mechanical strains in the mixture and retaining the mixture in such shape until the polymerization is completed.

4,182,701

METHOD OF MAKING MOLDING COMPOUNDS AND PRODUCTS PRODUCED THEREBY

Walter D. Cottrell, Jr., Newark, and Ernest E. Lawson, Columbus, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 751,635, Dec. 17, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,261

Int. Cl.[2] C08L *61/06*

U.S. Cl. 260—38 **26 Claims**

1. A new and improved method of producing molding compounds comprising: mixing an aldehyde and a hydrogen donor for producing alkanol groups therewith with a major proportion of a water wettable inorganic filler and catalyst for the reaction, the materials being present in proportions capable of producing the infusible thermoset condition, controlling the amount of water present to maintain the consistency of a paste, causing a polymerization reaction to be initiated in the paste between the aldehyde and hydrogen donor, kneading the paste at a controlled rate to control the reaction of the aldehyde and hydrogen donor in the paste, and cooling the paste to stop the polymerization reaction while the materials are still a paste.

9. A new and improved method of making sheet molding compound comprising: mixing polymer forming monomers with an inorganic filler and catalyst for the polymerization reaction, the materials being present in proportions capable of producing the infusible thermoset condition, converting the mix into the consistency of a paste and initiating a polymerization reaction, kneading the paste at a controlled rate to control the rate of polymerization, cooling the paste to arrest the reaction short of a thermoset condition, forming a sheet molding compound of the paste with glass fibers, and drying the sheet molding compound to convert the material into a handleable state.

4,182,702

NOVEL PROCESSING AIDS FOR NATURAL AND SYNTHETIC RUBBER COMPOUNDS

Nelson N. Schwartz, Paterson, N.J., assignor to Technical Processing, Inc., Paterson, N.J.

Filed Jun. 30, 1978, Ser. No. 920,951

Int. Cl.[2] C08K *9/04*

U.S. Cl. 260—42.16 **13 Claims**

1. An improved rubber processing aid comprising:

(a) natural or synthetic clay upon which is deposited

(b) an amine of the general formula:

$$R^4R^5R^6N$$

wherein R^4 is alkyl or hydroxyalkyl, of from 1 to about 20 carbon atoms; each of R^5 and R^6 is hydrogen, alkyl or hydroxyalkyl of from 1 to about 20 carbon atoms; and R^4 and R^5, when taken together, form a divalent alkylene or alkylenoxyalkylene radical containing up to about 7 carbon atoms, which when combined with $=NR^6$, forms a cyclic amine having from 5 to 7 ring members; and

(c) an aralkylsulfonic acid of the general formula:

$$R_x—R^7—(SO_3H)_m$$

wherein R is an alkyl group of from 1 to 18 carbon atoms; R^7 is an arylene group of from 6 to 14 carbon atoms; and each of x and m has a value of from 1 to 4 such that the sum of x and m has a value of from 2 to 5.

4,182,703

BIHETEROCYCLIC ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

Gether Irick, Jr.; James C. Ownby, and Richard H. S. Wang, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 9, 1978, Ser. No. 867,846

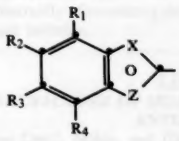
Int. Cl.[2] C08K *5/45, 5/46;* **C07D** *413/12, 417/12*

U.S. Cl. 260—45.8 RW **26 Claims**

1. A composition of matter comprising biheterocyclic compounds having the formula:

$$A—B—C$$

wherein A is a group having the formula:



wherein

X is a carbon atom or a nitrogen atom;

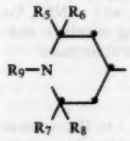
Z is an oxygen atom, a sulfur atom, a nitrogen atom, or a nitrogen atom containing a hydrogen atom or a lower alkyl group containing 1 to 12 carbon atoms;

R_1, R_2, R_3 and R_4 are hydrogen, lower alkyl, cyclohexyl, phenyl, lower alkyl phenyl, phenyl-substituted-phenyl, chloro, bromo, lower alkoxy, lower alkyl substituted amino, cyano, and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which

they are attached, are joined lower alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

wherein B is a linking group connecting A and C and can be carbonyloxy, oxycarbonylalkyleneoxy, oxycarbonyl, alkyleneoxycarbonyloxy, oxyalkylenecarbonyl, oxycarbonyloxy, alkyleneoxy, oxyalkylene, alkyleneoxyalkyleneoxy, thio, thioalkyleneoxy, sulfinyldioxy, oxy(alkoxy)phosphinooxy, alkyloxyphosphinylidene, aryloxyphosphinylidene, oxy(alkyl)phosphinyloxy, aminocarbonyl, N-alkylaminocarbonyl, N-arylaminocarbonyl, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N,N-dialkylaminocarbonyl, N,N-diarylaminocarbonyl, N-alkylaminoalkyleneoxy, N-arylaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy, alkyleneaminoalkylene, aryleneaminoarylene, aryleneaminoalkylene and alkyleneaminoarylene; with the proviso that in the above definitions of B, alkyl indicates loweralkyl, alkylene indicates lower alkylene, alkoxy indicates lower alkoxy, aryl indicates phenyl, naphthyl or lower alkyl substituted phenyl or naphthyl and arylene indicates phenylene or naphthylene; and

wherein C is a group having the formula

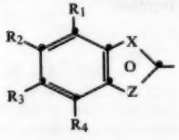


R_5 and R_6 are each alkyl having 1–6 carbons; R_7 and R_8 are each alkyl having 1–6 carbons or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group; and R_9 is hydrogen, oxy, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 or 4 carbon atoms, propargyl, benzyl or lower alkyl substituted benzyl.

14. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one biheterocyclic compound having the formula:

A—B—C

wherein A is a group having the structure



wherein

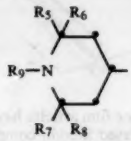
X is a carbon atom or a nitrogen atom;

Z is an oxygen atom, a sulfur atom, a nitrogen atom, or a nitrogen atom containing a hydrogen atom or a lower alkyl group containing 1 to 12 carbon atoms;

R_1, R_2, R_3 and R_4 are hydrogen, lower alkyl, cyclohexyl, phenyl, lower alkyl phenyl, phenyl-substituted-phenyl, chloro, bromo, lower alkoxy, lower alkyl substituted amino, cyano, and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined lower alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

B is a linking group connecting A and C and can be alkylene, arylene, carbonyloxy, oxycarbonylalkyleneoxy, oxycarbonyl, alkyleneoxycarbonyloxy, oxyalkylenecarbonyl, oxycarbonyloxy, alkyleneoxy, oxyalkylene, alkyleneoxyalkyleneoxy, thio, thioalkyleneoxy, sulfinyldioxy, oxy(alkoxy)phosphinooxy, alkyloxyphosphinylidene, aryloxyphosphinylidene, oxy(alkyl)phosphinyloxy, aminocarbonyl, N-alkylaminocarbonyl, N-arylaminocarbonyl, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N,N-dialkylaminocarbonyl, N,N-diarylaminocarbonyl, N-alkylaminoalkyleneoxy, N-arylaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy, alkyleneaminoalkylene, aryleneaminoarylene, aryleneaminoalkylene and alkyleneaminoarylene; with the proviso that in the above definitions of B, alkyl indicates loweralkyl, alkylene indicates lower alkylene, alkoxy indicates lower alkoxy, aryl indicates phenyl, naphthyl or lower substituted phenyl or naphthyl and arylene indicates phenylene or naphthylene; and

wherein C is a group having the formula



R_5 and R_6 are each alkyl having 1–6 carbons; R_7 and R_8 are each alkyl having 1–6 carbons or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group; and R_9 is hydrogen, oxy, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 or 4 carbon atoms, propargyl, benzyl or lower alkyl substituted benzyl.

4,182,704

HINDERED PHENYL PHOSPHITES

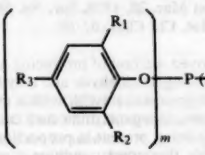
John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 710,063, Jul. 30, 1976, Pat. No. 4,094,855. This application May 8, 1978, Ser. No. 904,064

Int. Cl.[2] **C07F** *9/145;* **C08K** *5/52*

U.S. Cl. 260—45.8 NT **15 Claims**

1. A compound of the formula



wherein

R_1 and R_2 are independently lower alkyl or hydrogen, provided that only one of R_1 and R_2 is hydrogen,

R_3 is —(A)—$COOR_4$ or CN where

A is alkylene of 1 to 24 carbon atoms,

R_4 is alkyl of 1 to 24 carbon atoms, phenyl or alkyl substituted phenyl

q is 0 or 1

m and n are each 1 or 2, the values of m and n being such that the trivalent state of is satisfied, and

R_5 is alkanoyl, benzoyl, or alkyl substituted benzoyl.

10. A composition of matter comprising an organic polymeric synthetic material normally subject to thermal, oxidative and ultraviolet degradation and stabilized with

(a) 0.005% to 5% of a stabilizing compound according to claim 1,

(b) 0 to 5% of a phenolic antioxidant,

(c) 0 to 5% of a thio co-stabilizer,

(d) 0 to 5% of a UV absorber, and

(e) 0 to 5% of a light stabilizer.

4,182,705

POLYMER COMPOSITIONS CONTAINING AS ANTIOXIDANTS SUBSTITUTED DIAMINOPROPANES

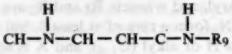
Neil E. S. Thompson, Creve Coeur, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 815,886, Jul. 15, 1977, Pat. No. 4,129,597. This application Jun. 16, 1978, Ser. No. 916,178

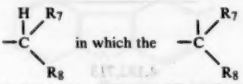
Int. Cl.[2] C08K 5/17

U.S. Cl. 260—45.9 R 11 Claims

1. An unsaturated polymer composition containing antioxidant amounts of a compound of the formula



where R_9 is hydrogen or a group of the formula



moiety is the residue of an aldehyde or ketone in which the two unsatisfied valences attached to the indicated carbon of said moiety are attached to the same oxygen atom and R_7 and R_8 together with the carbon to which they are joined may form a cyclohexane or cyclopentane ring or alkyl substituted derivative thereof and μ together with the carbon or carbon atoms to which it is shown attached indicates a cyclopentyl or cyclohexyl cycloalkyl ring or such a cycloalkyl ring substituted by alkyl, halo, alkoxy, or phenyl.

4,182,706

FLAME-RETARDANT AGENTS FOR PHENOLIC RESINS AND PROCESS FOR THEIR PRODUCTION

Herbert Jenkner, and Robert Strang, both of Cologne, Fed. Rep. of Germany, assignors to Chemische Fabrik Kalk GmbH, Cologne, Fed. Rep. of Germany

Filed May 16, 1978, Ser. No. 906,416

Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721889

Int. Cl.[2] C08K 5/52

U.S. Cl. 260—45.95 G 6 Claims

1. A method for reducing the combustibility of a phenol resin laminate in the form of a hard paper of hard fabric of the type used as an insulating material in power engineering and telecommunications as well as in electronics, comprising homogeneously dispersing in the phenolic resin used to prepare the laminate a flame retarding amount of a nuclear-brominated phenyl glyceryl monoether prepared by reacting a nuclear-brominated phenol with 2,3-epoxypropanol-1 in the presence of an alkaline material at a temperature between about 60° and 120° C.

4,182,707

SOMATOSTATIN ANALOGUES

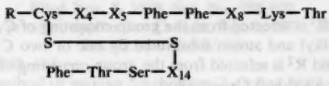
Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jun. 28, 1978, Ser. No. 920,109

Int. Cl.[2] C07C 103/52; A61K 37/00

U.S. Cl. 260—112.5 S 5 Claims

1. A polypeptide of the formula:



its linear precursor or a non-toxic acid addition salt thereof, in which

R is hydrogen, Ala-Gly, Ala-D-Ala, Gly-Gly, Gly-Gly-Gly, lower alkanoyl or benzoyl;

X_4 is D-Lys, D-Arg, D-His or D-Orn;

X_5 is Trp, Phe, Tyr, Leu or Met;

X_8 is L-Trp or D-Trp; and

X_{14} is Cys or D-Cys.

4,182,708

PROCESS FOR THE PREPARATION OF AZO PIGMENTS BY DIAZOTIZING IN A DIPOLAR APROTIC ORGANIC SOLVENT AND AZO PIGMENTS OBTAINED THEREFROM

Josef Landler, Hofheim; Klaüs Hünger, Kelkheim, and Erhard Wörfel, Hattersheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 619,460, Oct. 3, 1975, abandoned, which is a continuation of Ser. No. 325,549, Jan. 22, 1973, abandoned. This application Jan. 21, 1977, Ser. No. 761,071

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1972, 2202773

Int. Cl.[2] C09B 29/20, 29/32, 29/36, 29/38

U.S. Cl. 260—208 7 Claims

1. In a process for the preparation of an azo pigment by diazotizing a diazotizable aromatic amine containing non-solubilizing substituents, in a water-miscible aprotic organic solvent and coupling the diazonium compound thus obtained with a coupling component selected from the group consisting of 2-hydroxy-3-naphthoylaminoarylides, acetoacetylaminoaryles, pyrazolones, hydroxy-quinolines, 2-hydroxy-3-naphthoylamino-benzimidazolones and acetoacetylaminobenzimidazolones, to form an azo pigment, the improvement comprising: diazotizing said amine in an anhydrous dipolar aprotic solvent with from stoichiometric to 20% in excess of stoichiometric amounts of nitrosyl sulfuric acid or nitrosyl chloride at a temperature of from −20° to 40° C.; neutralizing the acid; and thermally aftertreating the pigment formed, without intermediate isolation.

4,182,709

MANUFACTURE OF SEMI-SYNTHETIC PENICILLIN ANTIBIOTICS

Marco Croci, Milan, and Gino Cotti, Monza, both of Italy, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 758,322, Jan. 10, 1977, abandoned. This application Jun. 9, 1978, Ser. No. 914,288

Claims priority, application Italy, Jan. 15, 1976, 47642 A/76

Int. Cl.[2] C07D 499/68

U.S. Cl. 260—239.1 10 Claims

1. In a process for the manufacture of a 6-acylaminopenicillanic acid antibiotic product by acylating a mono- or bis-silylated derivative of 6-aminopenicillanic acid with an acid chloride or protected acid chloride corresponding to the desired 6-acylamido group at a temperature from about +10° to

about −30° C. in an inert organic solvent in the presence of from about 1.0 to about 4.0 times the stoichiometric amount of a hydrogen halide acceptor, cleaving silyl groups with water and other protecting groups in the resultant product and recovering the desired antibiotic product, the improvement which comprises employing a hydrogen halide acceptor which is a compound of formula (I)

$$R^1CONHR^2 \quad (I)$$

wherein R^1 is selected from the group consisting of C_{1-6} alkyl, C_{7-20} aralkyl and amino substituted by one or two C_{1-6} alkyl groups and R^2 is selected from the group consisting of hydrogen, C_{1-6} alkyl and C_{7-20} aralkyl.

4,182,710

KETENIMINE INTERMEDIATES FOR 6α-METHOXY-α-CARBOXY PENICILLINS

Andrew W. Taylor, Reigate; George Burton, Sutton, and John P. Clayton, Horsham, all of England, assignors to Beecham Group Limited, England

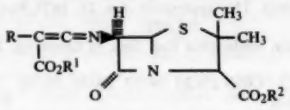
Filed Jun. 22, 1977, Ser. No. 808,825

Claims priority, application United Kingdom, Jun. 26, 1976, 26720/76

Int. Cl.² C07D 277/04

U.S. Cl. 260—245.2 **15 Claims**

1. A ketenimine, having the formula (I):



(I)

wherein R is 2-thienyl, 3-thienyl, phenyl or 4-hydroxyphenyl;
CO_2R^1 represents an esterified α-carboxy group; and
CO_2R^2 represents an in vivo hydrolysable esterified 3-carboxy group or a carboxylic acid salt, ester or anhydride.

4,182,711

ANTIBACTERIAL AGENTS OF THE β-LACTAM TYPE

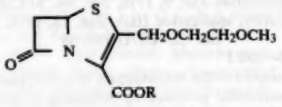
Yasutsugu Ueda, St. Lambert, Canada, assignor to Bristol-Myers Company, New York, N.Y.

Filed Apr. 27, 1978, Ser. No. 900,466

Int. Cl.² C07D 277/00

U.S. Cl. 548—178 **17 Claims**

1. A compound of the formula



wherein R is hydrogen or an easily removable ester protecting group, or a pharmaceutically salt thereof.

4,182,712

5-SUBSTITUTED THIADIAZOLE UREAS

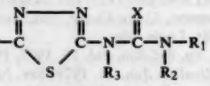
Patrick R. Driscoll, Spotswood, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 316,794, Dec. 20, 1972, which is a division of Ser. No. 296,389, Oct. 10, 1972, which is a continuation-in-part of Ser. No. 71,248, Sep. 10, 1970, abandoned, which is a division of Ser. No. 818,078, Apr. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 782,756, Dec. 10, 1968, abandoned, which is a continuation-in-part of Ser. No. 702,189, Feb. 1, 1968, abandoned. This application Dec. 22, 1977, Ser. No. 863,374

Int. Cl.² A01N 9/12; C07D 285/12, 417/12

U.S. Cl. 548—140 **3 Claims**

1. A compound of the formula:



wherein R is cycloalkyl (C_3–C_6); R_1 is selected from the group consisting of H, alkyl (C_1–C_4), and cycloalkyl (C_3–C_6); R_2 is from the group consisting of H, alkyl (C_1–C_4), haloalkyl (C_1–C_4), alkoxy (C_1–C_4), alkenyl (C_2–C_4), alkynyl (C_2–C_4), aryl, and haloaryl, and wherein R_1 and R_2 are alkylene which, together with N, form a ring of at least 3, but not more than 6 members; R_3 is H or alkyl (C_{1-6}); and X is selected from the group consisting of oxygen and sulfur.

4,182,713

BENZOTRIAZOLES USEFUL AS AZO DYESTUFF INTERMEDIATES

Hermann Goebel, Leverkusen, and Erich Krämer, Berg. Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

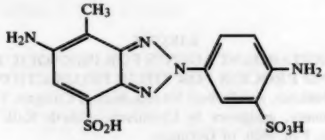
Filed Apr. 13, 1978, Ser. No. 896,143

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1977, 2716503

Int. Cl.² C07D 253/02

U.S. Cl. 548—259 **1 Claim**

1. Compound which, in the form of the free acid, corresponds to the formula



4,182,714

CARBAZOLE CONTAINING PHTHALIDES

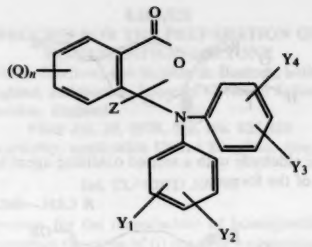
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 755,376, Dec. 29, 1976, abandoned. This application Aug. 4, 1977, Ser. No. 821,926

Int. Cl.² C07D 405/04

U.S. Cl. 260—315 **2 Claims**

1. A compound having the formula



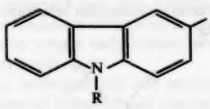
wherein:

Q is selected from the group consisting of di-lower-alkylamino, nitro, halo and COX where X is hydroxyl, benzyloxy, alkoxy having from 1 to 18 carbon atoms or OM where M is an alkali metal cation, an ammonium cation or a mono-, di- or trialkylammonium cation having from 1 to 18 carbon atoms;

n is 0; or 1 when Q is di-lower-alkylamino, nitro or COX; or from 1 to 4 when Q is halo;

Y_1, Y_2, Y_3 and Y_4 are the same or different and are selected from the group consisting of hydrogen, halo, hydroxyl, lower-alkoxy, alkyl having from 1 to 9 carbon atoms, phenyl-lower-alkyl, $COOR_4$ and NR_5R_6 where R_4 and R_5 are hydrogen or lower-alkyl and R_6 is hydrogen, lower-alkyl, cycloalkyl having from 5 to 7 carbon atoms, or lower alkanoyl;

Z is a radical having the formula



in which R is hydrogen or non-tertiary alkyl having from 1 to 4 carbon atoms.

4,182,715

AMINE DERIVATIVES OF SUBSTITUTED GAMMA-BUTYROLACTONES

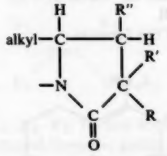
El-Ahmadi I. Heiba, Princeton, and Ralph M. Dessau, Edison Township, Middlesex County, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 659,803, Feb. 20, 1976, Pat. No. 4,081,456, which is a continuation of Ser. No. 336,564, Feb. 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 799,939, Feb. 17, 1969, abandoned, which is a continuation-in-part of Ser. No. 714,447, Mar. 20, 1968, abandoned and Ser. No. 176,267, Aug. 30, 1971, Pat. No. 3,734,865 is a continuation-in-part of said Ser. No. 799,939. This application Feb. 2, 1978, Ser. No. 874,310

Int. Cl.² C07D *207/26*

U.S. Cl. 260—326.5 FL **1 Claim**

1. A compound having the structure:



wherein the alkyl group has from 16 to 100 carbon atoms; R, R' and R" are individually selected from the group consisting of hydrogen, methyl and ethyl; and —N represents one of the two terminal amino nitrogen atoms of a polyalkylenepolyamine $H_2N(C_2H_4NH)_mH$ wherein m is 3 or 4.

4,182,716

METHOD OF MAKING 5,6-DIHYDRO-2-METHYL-N-PHENYL-1,4-OXATHIIN-3-CARBOXAMIDE

Andrew A. Znotins, Guelph, and Arthur D. Brewer, Puslinch, both of Canada, assignors to Uniroyal, Ltd., Ontario, Canada

Filed Nov. 8, 1978, Ser. No. 958,909

Claims priority, application Canada, Sep. 5, 1978, 310616

Int. Cl.² C07D *327/06*

U.S. Cl. 549—14 **21 Claims**

1. A method of making 5,6-dihydro-2-methyl-N-phenyl-1,4-oxathiin-3-carboxamide comprising the steps of:

(A) providing 2-methyl-N-phenyl-1,3-oxathiolane-2-acetamide;

(B) bringing together the 2-methyl-N-phenyl-1,3-oxathiolane-2-acetamide and hydrogen peroxide under basic conditions, in the presence of a catalytic quantity of a suitable heavy metal compound oxidation catalyst effective to catalyze the oxidation of said 2-methyl-N-phenyl-1,3-oxathiolane-2-acetamide by the said hydrogen peroxide, in a liquid medium comprising water, or water plus at least one nonprotic organic liquid selected from the group consisting of (a) aromatic hydrocarbon solvent having a boiling point not greater than 145° C., (b) chlorinated hydrocarbon solvent having a boiling point not greater than 130° C., and (c) a solvent having a boiling point not greater than 130° C. which is an alkyl ester of an aliphatic carboxylic acid, and subjecting the resulting mixture while agitating to a temperature of from 0°–25° C., whereby 2-methyl-N-phenyl-1,3-oxathiolane-2-acetamide 3-oxide is formed;

(C) bringing together the 2-methyl-N-phenyl-1,3-oxathiolane-2-acetamide 3-oxide and a catalytic quantity of a quaternary ammonium salt under acidic conditions in a nonprotic organic liquid as defined in step (B) above, and heating the mixture at a temperature of 45°–80° C. while removing evolved water of reaction, and thereafter recovering from the reaction mixture the thus formed 5,6-dihydro-2-methyl-N-phenyl-1,4-oxathiin-3-carboxamide.

4,182,717

TOTAL SYNTHESIS OF THE UTERO-EVACUANT SUBSTANCE D,L-ZOAPATANOL

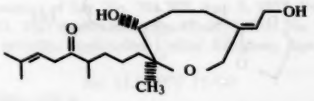
Robert H. K. Chen, Belle Mead, N.J., assignor to Ortho Pharmaceutical Corp., Raritan, N.J.

Filed Jun. 29, 1978, Ser. No. 920,433

Int. Cl.² C07D *313/04*

U.S. Cl. 260—333 **9 Claims**

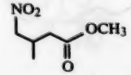
1. The process for preparing a compound of the formula



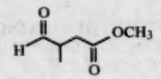
which comprises reacting nitromethane with a compound of the formula

$CH_3CH{=}CHCO_2CH_3$

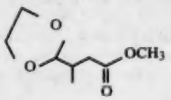
to produce a compound of the formula



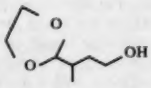
reacting the product with an oxidizing agent or a reducing agent to form an ester of the formula



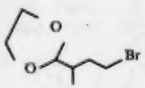
reacting the product formed with ethylene glycol to form a product of the formula



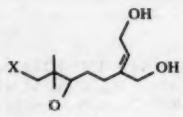
reducing the ester to form an alcohol of the formula



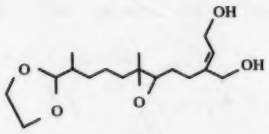
reacting the alcohol with a brominating agent to form a compound of the formula



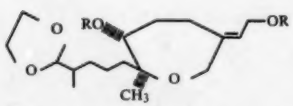
reacting the bromo compound with magnesium to form a Grignard reagent and then reacting the Grignard reagent with a compound of the formula



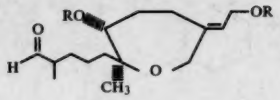
to form a compound of the formula



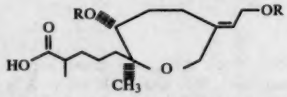
treating the product with a Lewis acid or a protic acid and reacting the product formed with an acylating agent to form an oxepane of the formula



hydrolyzing the product to form an aldehyde of the formula



reacting the aldehyde with a second oxidizing agent to form a compound of the formula



and reacting the product formed with an excess of 3-methyl-2-butenyl lithium, wherein R is an acyl group having 2–5 carbon atoms, and X is tosyl, mesyl, brosyl, chloro, bromo and iodo.

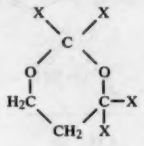
4,182,718

1,3-DIOXOLANE AND 1,3-DIOXANE POLYCARBOXYLATES, AND PRECURSORS THEREOF

Marvin M. Crutchfield, St. Louis, and Charles J. Upton, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 25, 1977, Ser. No. 844,569
Int. Cl.[2] C07D *319/04*
U.S. Cl. 260—340.7 **6 Claims**

1. A compound having a molecular structure represented by the generic formula:



wherein

(a) X is a substituent selected from the group consisting of H and COOM wherein M is selected from the group consisting of alkali metal, NH_4^+ and trialkanolammonium; and

(b) at least three of the X substituents in the molecular structure are substituents other than H.

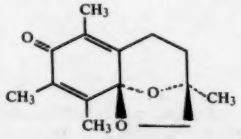
4,182,719

SYNTHESIS OF OPTICALLY ACTIVE VITAMIN E

Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 895,424, Apr. 12, 1978, Pat. No. 4,151,177, which is a division of Ser. No. 797,712, May 17, 1977, Pat. No. 4,113,740. This application Jan. 29, 1979, Ser. No. 7,277
Int. Cl.[2] C07D *317/10*
U.S. Cl. 260—340.9 R **1 Claim**

1. A compound of the formula



4,182,720

PROCESS FOR THE PREPARATION OF HOMOGENTISIC LACTONE

Andrew H. M. Renfrew, and Stephen B. Bostock, both of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 20, 1978, Ser. No. 926,323
Claims priority, application United Kingdom, Aug. 26, 1977, 35931/77
Int. Cl.[2] C07D *307/83*
U.S. Cl. 260—343.3 R 5 Claims

1. A process for the manufacture of homogentisic lactone which comprises the steps of (i) reacting hydroquinone with a di-(lower alkyl) chloromalonate or bromomalonate and an alkali metal lower alkoxide to give an alkali metal 3-carbo(-lower alkoxy)-5-hydroxy-2-oxidobenzo[b]furan, and (ii) treatment of the product obtained from step (i) with a strong mineral acid to give homogentisic lactone.

4,182,721

CATALYTIC HYDROGENATION OF CARBONYL CONTAINING ORGANIC COMPOUNDS

Waldo R. De Thomas, Parsippany, and Eugene V. Hort, Wayne, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Aug. 30, 1978, Ser. No. 938,008
Int. Cl.[2] C07D *307/44*
U.S. Cl. 260—347.8 9 Claims

1. A method of effectively and rapidly reducing a carbonyl group present in an aldehyde organic compound which comprises:

(a) forming a mixture of said compound and a Raney nickel catalyst comprising Raney nickel solids having adsorbed thereon a molybdenum compound in an amount of about 0.1–15 parts by weight molybdenum per 100 parts of the Raney nickel solids, and,

(b) introducing hydrogen into said mixture thereby to reduce the carbonyl group of said compound to the corresponding hydroxy group.

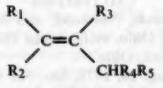
4,182,722

ION-EXCHANGED TRANSITION METAL CATALYSTS FOR THE DIRECT OXIDATION OF OLEFINS TO EPOXYALCOHOLS

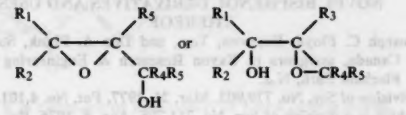
James E. Lyons, Wallingford, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 375,195, Jun. 29, 1973, abandoned. This application Sep. 29, 1975, Ser. No. 617,907
Int. Cl.[2] C07D *301/06*
U.S. Cl. 260—348.33 14 Claims

1. In a process for the oxidation of acyclic and cyclic monoolefins and corresponding diolefins to form the corresponding epoxyalcohols by the catalytic oxidation of olefins with air or oxygen, the improvement wherein the catalyst comprises a solid anionic support material having valence-bonded thereto two different transition metal cations, one of which is from Group IB or Group VIII of the Periodic Table, the other of which is from Group VB of the Periodic Table, wherein the monoolefin is of the general formula



wherein each of R_1, R_2, R_3, R_4 and R_5 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl, aryl, aralkyl, alkoxyl, and alkenyl, and wherein R_1 and R_3 are taken together may be a C_5 to C_{10} cyclic hydrocarbon moiety, and the resulting epoxyalcohol is of the formula



wherein R_1, R_2, R_3, R_4 and R_5 are as defined above.

4,182,723

OCULAR MEMBRANE AND METHOD FOR PREPARATION THEREOF

William S. Covington, West Cornwall, Conn., assignor to Permavision, Paramus, N.J.

Division of Ser. No. 677,246, Apr. 15, 1976. This application Nov. 4, 1977, Ser. No. 848,518
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—37 SB 15 Claims

1. A composition comprising a copolymer of a polysiloxane cross-linked by addition polymerization and a compound selected from the group consisting of:

(a) esters of glycidyl alcohol with acrylic acid or methacrylic acid; and

(b) maleic anhydride, nadic anhydride or hexahydrophthalic anhydride;

the amount of each such compound in said copolymer being effective to impart wettability to the surface of articles formed from said copolymer but less than that which would destroy the hydrophobic properties of said copolymer, and said composition having sufficient light transmission for use as an ocular membrane.

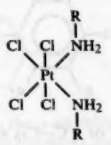
4,182,724

COMPOSITIONS CONTAINING PLATINUM

Martin L. Tobe, Northwood; Abdul R. Khokhar, London, and Peter D. M. Braddock, Wigan, all of England, assignors to Rustenburg Platinum Mines Limited, Johannesburg, South Africa

Continuation of Ser. No. 784,797, Apr. 5, 1977, Pat. No. 4,119,653. This application Aug. 18, 1978, Ser. No. 934,990
Claims priority, application United Kingdom, Apr. 6, 1976, 13888/76
Int. Cl.[2] C07F *15/00*
U.S. Cl. 260—429 R 1 Claim

1. An alkylamine platinum IV complex having the structure:



wherein R is butyl, pentyl, octyl or 3-methoxypropyl.

4,182,725
NOVEL BISPHENOL DERIVATIVES AND USES THEREOF

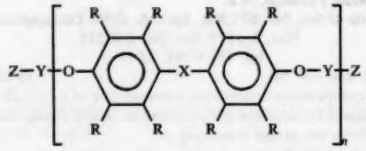
Joseph C. Floyd, Baytown, Tex., and Don A. Plank, Sarnia, Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 779,903, Mar. 21, 1977, Pat. No. 4,101,511, which is a division of Ser. No. 711,705, Aug. 5, 1976, Pat. No. 4,032,510, which is a continuation-in-part of Ser. No. 597,245, Jul. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 441,457, Feb. 11, 1974, abandoned. This application Apr. 3, 1978, Ser. No. 893,204

Int. Cl.[2] C08K *5/36, 5/11*

U.S. Cl. 260—45.85 S 6 Claims

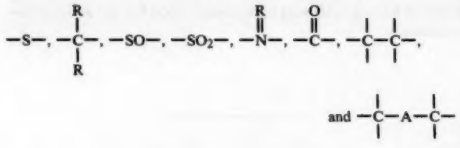
5. A composition of matter comprising an oxidatively degradable organic material selected from the group consisting of polyolefins, polyvinyl chloride, elastomers, polycarbonate plastics, lubricants, fuels, naptha, greases, waxes and petroleum resins having the following structural formula:



wherein:

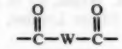
(1) R is selected from the group consisting of —H, C_1–C_{18} alkyl groups, and an aryl group;

(2) X is selected from the group consisting of



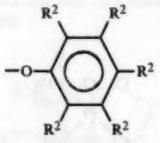
wherein A is a C_1–C_{16} alkylene or an arylene group;

(3) Y is



wherein W is $—(CH_2)_2—S—(CH_2)_k—S—(CH_2)_2—$ and wherein k ranges from 0 to 10;

(4) Z is selected from the group consisting of



wherein R^2 is —H or a C_1–C_{18} alkyl group, —OH, and OR^3 and R^3 is a C_1–C_{18} alkyl group; and

(5) n is a value ranging from 1 to about 15.

4,182,726
PROCESS FOR THE PREPARATION OF AROMATIC CARBONATES

Gabriello Illuminati, Rome; Ugo Romano, Milan, and Renato Tesei, San Donato Milanese, all of Italy, assignors to Snamprogetti, S.p.A., San Donato Milanese, Italy

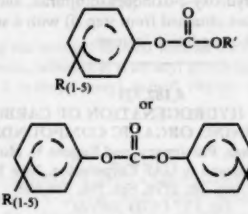
Continuation of Ser. No. 586,353, Jun. 12, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 782,164

Claims priority, application Italy, Jun. 25, 1974, 24392 A/74; Feb. 12, 1975, 20191 A/75; Apr. 18, 1975, 22472 A/75

Int. Cl.[2] C07C *68/06*

U.S. Cl. 260—463 4 Claims

1. The process of preparing an aromatic carbonate having the formula:



wherein R' is alkyl and R is a member of the group consisting of H, alkyl, alkoxy, aryl, aryloxy and NO_2, which comprises reacting a phenolic compound consisting of the respective phenol, or an acyl ester thereof, with an alkyl or aryl-alkyl carbonate in the presence of a catalyst selected from the group consisting of AlX_3, UX_3, TiX_3, TiX_4, VOX_3, VX_5, ZnX_2, FeX_3 and SnX_4, wherein X is a member of the group consisting of halogen, alkoxy, aryloxy and acetoxy, in the liquid phase, at a temperature in the range of from 25° to 350° C., at a pressure in the range of from 0.1 to 100 atmospheres, and wherein the phenol/carbonate ratio is from 100:1 to 1:100.

4,182,727
4-[6-(4-CYANOPHENOXY)HEXYL]-3,5-HEPTANEDIONE

Joseph C. Collins, East Greenbush, and Guy D. Diana, Stephentown, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 725,160, Sep. 21, 1976, Pat. No. 4,133,959, which is a continuation-in-part of Ser. No. 576,311, May 12, 1975, Pat. No. 4,031,246, which is a continuation-in-part of Ser. No. 381,406, Jul. 23, 1973, Pat. No. 3,933,837. This application Jun. 7, 1978, Ser. No. 913,366

Int. Cl.[2] C07C *121/75*

U.S. Cl. 260—465 F 1 Claim

1. 4-[6-(4-Cyanophenoxy)hexyl]-3,5-heptanedione.

4,182,728
PRESERVATION OF DICARBOXYLIC ACID CHLORIDES

Thomas A. Des Marais, Norwood, and Michael K. Hughes, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

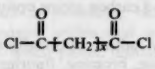
Filed Aug. 14, 1978, Ser. No. 933,317

Int. Cl.[2] C07C *51/42, 51/58*

U.S. Cl. 260—544 Y 14 Claims

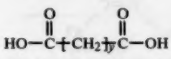
1. A method to separate an aliphatic dicarboxylic acid chloride from its discolored products of aging, comprising the steps of:

(a) Providing a quantity of a dicarboxylic acid chloride, having the formula



where x is an integer between 2 and 8 inclusive, which contains discolored products of aging;

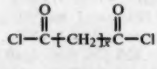
(b) Contacting therewith at least about 2 percent by weight of the composition of a dicarboxylic acid, having the formula



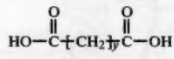
where y is an integer between 2 and 8 inclusive, to precipitate said discolored products of aging, producing a clarified dicarboxylic acid chloride; and

(c) Separating said clarified dicarboxylic acid chloride from said discolored products of aging and said dicarboxylic acid.

7. A method to prevent discoloration upon standing of a dicarboxylic acid chloride, having the formula

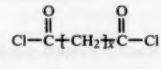


where x is an integer between 2 and 8 inclusive, comprising the step of storing said dicarboxylic acid chloride in contact with at least about 2 percent by weight of the composition of a dicarboxylic acid having the formula

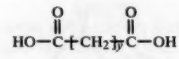


where y is an integer between 2 and 8 inclusive.

12. A stabilized dicarboxylic acid chloride composition comprising a major amount of a dicarboxylic acid chloride, having the formula



where x is an integer between 2 and 8 inclusive, stored in contact with at least about 2 percent by weight of the composition of a carboxylic acid having the formula



where y is an integer between 2 and 8 inclusive.

4,182,729

ARYLVINYL CYCLOPROPYL KETONES

Joseph C. Collins, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

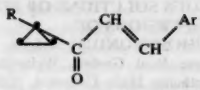
Division of Ser. No. 740,358, Nov. 10, 1976, Pat. No. 4,093,736, which is a continuation-in-part of Ser. No. 545,486, Jan. 30, 1975, which is a continuation-in-part of Ser. No. 436,611, Jan. 25, 1974, Pat. No. 3,917,718, which is a continuation-in-part of Ser. No. 265,333, Jun. 22, 1972, Pat. No. 3,829,475. This application Mar. 13, 1978, Ser. No. 885,575

Claims priority, application United Kingdom, Jun. 18, 1973, 28793/73

Int. Cl.[2] **C07C** *49/84;* **C07D** *317/06*

U.S. Cl. 260—590 C **7 Claims**

1. A compound of the formula



wherein R is hydrogen or lower-alkyl of 1 to 4 carbon atoms, and Ar is phenyl, naphthyl or phenyl substituted by 3,4-methylenedioxy or from one to three monovalent substituents selected from the group consisting of lower-alkyl of 1 to 4 carbon atoms, lower-alkoxy of 1 to 4 carbon atoms, halogen, trifluoromethyl, trifluoromethoxy, and benzyloxy.

4,182,730

PROCESS FOR THE PREPARATION OF SUBSTITUTED DIHYDROCINNAMALDEHYDES VIA NOVEL β-CHLOROCINNAMALDEHYDES

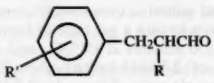
Joseph A. Virgilio; Thomas F. Wood, both of Wayne; Emanuel Heilweil, Fairfield, and Harold A. Brandman, Glen Ridge, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Nov. 25, 1977, Ser. No. 854,927

Int. Cl.[2] **C07C** *45/00*

U.S. Cl. 260—599 **7 Claims**

1. A process for preparing a substituted α-alkyldihydrocinnamaldehyde of the formula

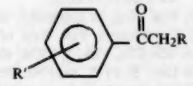


wherein:

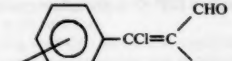
R′ represents hydrogen, methoxy or one or more alkyl groups wherein the number of carbon atoms in R′ does not exceed seven;

R is an alkyl group of from one to eight carbons; and

the number of carbon atoms in the sum of R and R′ is not less than two and is not greater than eight; which comprises reacting a ketone of the formula



with a Vilsmeier reagent, prepared by reacting dimethylformamide with phosphorous oxychloride or phosgene, to provide the intermediate α-alkyl-β-chlorocinnamaldehyde



and then hydrogenating to the α-alkyldihydrocinnamaldehyde in the presence of a catalyst consisting essentially of palladium, water and a base.

4,182,731

PREPARATION OF AQUEOUS SOLUTIONS OR FINE AQUEOUS DISPERSIONS OF POLYENYLTRIARYLPHOSPHONIUM SALTS

Bernhard Schulz, Schwetzingen; Paul Grafen, Weisenheim; Hans-Ulrich Scholz, Lampertheim; Hans Grassner, Heidelberg, and Werner Reif, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,356

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727384; Jul. 2, 1977, 2729974

Int. Cl.[2] C07F *9/54*

U.S. Cl. 260—606.5 F **4 Claims**

1. A process for converting an organic solvent solution containing from 10 to 70% strength by weight of a polyenyltriarylphosphonium salt of the formula I

$$[R—P(Ar)_3]^+X^- \quad (I)$$

wherein R is an aliphatic, cycloaliphatic-aliphatic or aromatic-aliphatic polyenyl radical of 5 to 20 carbon atoms, X is the anion equivalent of a strong acid, and Ar is aryl to a substantially organic solvent-free aqueous solution or fine dispersion, which comprises:

contacting said organic solvent solution of I with steam to drive out of the solution the solvent while maintaining said solution at a temperature of from 30°–120° C., and

condensing a part of the steam to produce the aqueous solution or fine dispersion.

4,182,732

THERMOSETTING PHENOLIC RESIN COATING AND ADHESIVE COMPOSITIONS

John S. Fry, Hillsborough Township, Somerset County, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,494

Int. Cl.[2] C08G *8/20*; C08L *61/12*

U.S. Cl. 525—482 **11 Claims**

1. A coating and adhesive composition comprising a solid phenolic resole resin having a gel time of between about 150 seconds to about 250 seconds at 150° C., said resin being the reaction product of 2,2-bis(4-hydroxyphenyl) propane and formaldehyde at a mole ratio of from about 2.11 to about 2.64 moles of formaldehyde per mole of 2,2-bis(4-hydroxyphenyl) propane in the presence of a catalytic quantity of a condensation catalyst selected from the group consisting of an alkali metal hydroxide, barium oxide, and barium hydroxide at a temperature of at least about 70° C. that is acidified to a pH of from about 3 up to 7.0 and dehydrated.

4,182,733

PROCESS FOR PREPARING PHOSPHORIC ACID ESTERHALIDES

Dieter Arlt, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 654,670, Feb. 2, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,153

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1975, 2507779

Int. Cl.[2] C07F *9/20*

U.S. Cl. 260—982 **7 Claims**

1. Process for preparing a phosphoric acid esterchloride which comprises simultaneously reacting at a temperature of between −50° and +120° C. a phosphoric acid ester of formula I

(I)

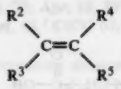
wherein

R is alkoxy with 1–8 carbon atoms optionally substituted by halogen, and

R′ is C_1–C_8 alkoxy radical, optionally substituted by halogen, or is chlorine, bromine, fluorine or C_1–C_6 alkyl or phenyl each optionally substituted by halogen, and

X is fluorine, chorine or bromine,

with an elementary halogen and an olefin of the formula II



(II)

wherein

R^2 represents fluorine, chlorine or bromine,

R^4 represents hydrogen, a C_1–C_6 alkane radical or the phenyl radical, and

R^3 and R^5 are the same or different and each is hydrogen, halogen or C_1–C_4 alkyl.

4,182,734

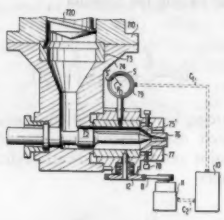
METHOD FOR PRODUCING FOAMED PLASTIC INSULATED WIRES

Hideo Takano; Yukio Shimohori, and Shigeho Fukuda, all of Ibaragi, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Continuation of Ser. No. 628,626, Nov. 4, 1975, abandoned. This application Apr. 3, 1978, Ser. No. 892,549

Int. Cl.[2] B29D *27/00*

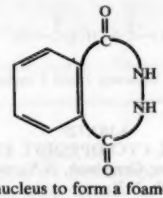
U.S. Cl. 264—40.5 **4 Claims**



1. A method of producing foamed plastic insulated wires comprising the steps:

(a) mixing a gaseous foaming agent in a resin melt,

(b) mixing in said resin melt phthalic hydrazide (2,3-dihydro-1,4-phthalazinedione) having the structural formula,



which serves as a nucleus to form a foamed construction having bubbles,

(c) passing the molten mixture of said resin melt, said agent and said organic compound through a narrow passage,

(d) thereafter passing said molten mixture through a wide passage and subsequently to an extrusion orifice through which a wire is drawn, said narrow passage, said wide passage and said orifice communicating with one another in the order mentioned along the direction of travel of said wire, said narrow passage serving to facilitate forming of bubbles in said wide passage by compressing the molten plastic in said narrow passage, the pressure in said wide

passage being sufficiently low as compared to said narrow passage to result in producing bubbles in said molten mixture as it passes within said wide passage and the extrusion of a foamed plastic insulator on said wire, said narrow passage serving further to prevent pressure variation in said wide passage due to variations in extruding pressure.

4. The method of claim 1 further comprising the steps of monitoring the pressure in said wide passage and altering the pressure therein whenever it deviates from a predetermined normal pressure.

4,182,735

PRODUCTION OF HIGH CRIMP, HIGH STRENGTH, HOLLOW RAYON FIBERS

Eugene Costa, Jr., Goshen, and Madhu P. Godsay, Monroe, both of N.Y., assignors to International Paper Company, New York, N.Y.

Filed May 25, 1978, Ser. No. 908,982
Int. Cl.[2] D01F 2/08
U.S. Cl. 264—54 **10 Claims**

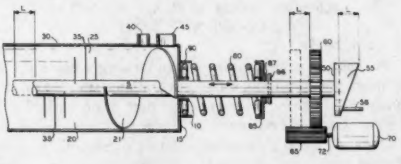
1. A process for producing high crimp, high strength, hollow rayon fibers resistant to collapse after drying and having at least about 20 crimps to the inch, which process comprises spinning a viscose solution containing alkali cellulose, a blowing agent selected from the class consisting of alkali-metal carbonates and alkali-metal bicarbonates, carbon disulfide, in an amount of between about 50 percent and 75 percent by weight of cellulose, and ripened to a Salt Index of from about 6 to 12 cubic centimeters of sodium chloride, into an aqueous acidic coagulating bath containing from about 150 to 300 grams per liter of sodium sulfate, from about 50 to 80 grams per liter of sulfuric acid, and from about 30 to 90 grams per liter of zinc sulfate, and thereafter stretching the resulting hollow fibers by between about 40 and 180 percent.

4,182,736

METHOD FOR PELLETING CARBON BLACK

Thomas J. Gunnell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 700,435, Jun. 28, 1976, Pat. No. 4,099,899. This application Apr. 27, 1978, Ser. No. 900,640
Int. Cl.[2] B01J 2/10
U.S. Cl. 264—117 **3 Claims**



1. A method for pelletizing carbon black in a pelleter having a chamber and a rotating shaft said shaft having pins radially mounted thereon which comprises:

introducing carbon black together with a wetting agent into the pelleter;

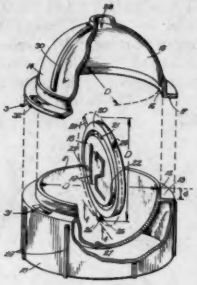
axially oscillating the rotating shaft so that the pins prevent buildup of carbon black cake on the inside of the chamber; and maintaining conditions for pelletizing as the carbon black is moved through the pelleter.

4,182,737

MOLDING OF A SHOCK RESISTANT TRANSPARENT POLYMER SPHERE

Terry M. Haber, Costa Mesa, and Marlin D. Fernandez, Bloomington, both of Calif., assignors to Joseph L. Fernandez, Bloomington, Calif.

Division of Ser. No. 857,297, Dec. 5, 1977. This application Aug. 21, 1978, Ser. No. 935,464
Int. Cl.[2] B29C 17/12, 6/02
U.S. Cl. 264—135 **2 Claims**



1. A method of manufacturing a shock resistant transparent polymer sphere with a disc, having a symbol inked on each of its opposite faces, diametrically incorporated in the sphere with the center of gravity of the disc coincident with the center of gravity of the sphere, including the steps of:

(a) providing a mold defining a spherical cavity with a single fill opening at its top;

(b) providing a given transparent polyester resin in liquid form preparatory to pouring into said mold, said resin having a given index of refraction and a given density after curing;

(c) providing an opaque disc of thermoplastic material having substantially the same density as said given density but constituting a plastic different from said polyester resin, said material having the characteristics of mechanically and chemically bonding with said resin without any surface deterioration and which material swells slightly upon extended contact with said polyester resin;

(d) providing an ink constituting a polyester and thermoplastic alloy which will function as a catalyst for said thermoplastic resin and will bind to both said disc and said resin;

(e) providing a holder in the form of an annular ring having a plurality of equally circumferentially spaced lugs extending radially inwardly equal distances, said ring being of thermoplastic material which will mechanically and chemically bond with said polyester resin, and which has the same index of refraction, transparency, Rockwell hardness and surface finishing characteristics as said polyester resin after curing;

(f) silk-screening said symbol on each of the opposite sides of said disc with said ink;

(g) positioning said disc in central coplanar relationship in said ring, said lugs engaging the periphery of said disc at equal circumferentially spaced points to hold it centered to provide a disc-ring assembly;

(h) positioning said disc-ring assembly in said spherical cavity of said mold so that the center of said disc coincides with the center of said spherical cavity;

(i) pouring said resin into said fill opening to completely fill said cavity and thereby encapsulate said disc-ring assembly;

(j) removing the polyester resin with said disc-ring assembly encapsulated therein after curing, said ring being substantially invisible; and

(k) polishing the surface of the resulting sphere to provide said shock resistant transparent polymer sphere, the bonding of the disc and ink to each other and to the polyester resin resulting in an embossed characteristic for the symbols as a result of said slight swelling of the disc material and the further bonding of the ring with the disc and resin resulting in a sphere in which shock is absorbed by the disc, ink and ring as well as the resin as though the entire sphere were homogeneous throughout.

4,182,738

METHOD OF MANUFACTURING HELICAL MEMBERS FROM A SYNTHETIC EXTRUDED MATERIAL

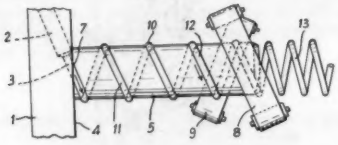
René Casaert, Lille, and Michel Pavy, Wattignies, both of France, assignors to Nortene, Lille, France

Filed Jan. 17, 1977, Ser. No. 759,659

Claims priority, application France, Jan. 19, 1976, 76 01241

Int. Cl.[2] D01D *5/12*

U.S. Cl. 264—210.2 **4 Claims**



1. Method of manufacturing helical members of synthetic material, which method comprises the steps of,

extruding an elongate member from synthetic material directly onto a fixed cylindrical element,

causing said member while still deformable in the plastic state to follow a helical path of travel around the fixed cylindrical element, the direction of extrusion being substantially tangential to the point at which said extruded member enters said helical path,

permitting said member to cool as it travels along said path until it becomes rigid,

and exerting on at least one point on the helical rigid portion of said member, a tractive force oriented substantially in the direction in which said member is travelling at that point.

4,182,739

BLOOD OXYGENATOR

Robert M. Curtis, Laguna Niguel, Calif., assignor to Shiley Incorporated, Irvine, Calif.

Continuation-in-part of Ser. No. 655,039, Feb. 3, 1976, Pat. No. 4,067,696. This application Jan. 9, 1978, Ser. No. 868,168

Int. Cl.[2] A61M *1/03*

U.S. Cl. 422—47 **11 Claims**

1. A blood oxygenator for admixing blood and oxygen for absorption of oxygen and release of carbon dioxide comprising:

an oxygenating chamber;

first means for introducing blood and oxygen into said oxygenating chamber comprising venous blood and oxygen inlet means therein;

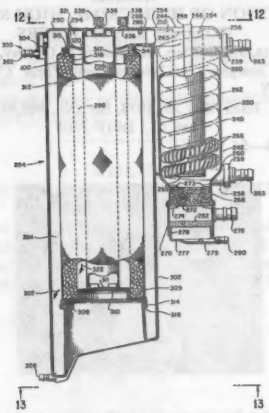
second means coupled to said oxygen inlet means for introducing a plurality of bubbles of oxygen in the venous blood;

third means downstream of and spaced from said second means for producing substantial mixing and churning together of the blood and oxygen bubbles sufficiently to disturb the diffusion boundary layers at the surfaces of the oxygen bubbles to facilitate the reaction of the oxygen with the blood hemoglobin and characterized by the production of blood foam;

fourth means coupled to said oxygenating chamber for containing the arterialized blood and blood foam produced by said mixing and churning;

defoamer means for defoaming said contained blood and blood foam and producing arterialized whole blood; and

dual mode gas venting means integral with said fourth means and in fluid communication with said defoamer means, for venting gases released by said defoamer means, and comprising:



first venting means for allowing the free flow of said gases out of said fourth means to the ambient environment; and

second venting means, integral with and in fluid communication with said first venting means and the ambient environment, for applying a negative pressure from an external vacuum source to said first venting means and the ambient environment without substantially affecting the free flow of said gases out of said fourth means and without imparting a significant negative pressure to the interior of said blood oxygenator, so that said gases are removed from said first venting means and from the ambient environment through said second venting means in response to said negative pressure.

4,182,740

FLAME IONIZATION DETECTOR

Charles H. Hartmann, Moraga, Calif., and Michael R. Martin, Gastonia, N.C., assignors to Varian Associates, Inc., Palo Alto, Calif.

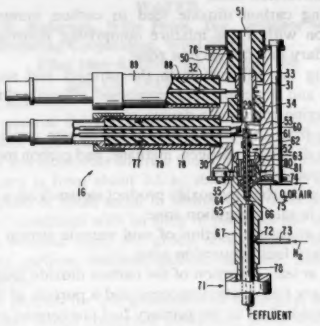
Continuation of Ser. No. 662,676, Mar. 1, 1976, abandoned. This application Jul. 28, 1977, Ser. No. 820,067

Int. Cl.[2] G01N *27/62, 31/12*

U.S. Cl. 422—54 **4 Claims**

1. A flame ionization detector comprising a flame tip member; means for providing a fuel gas and an oxidizing gas to the vicinity of said flame tip member so that, in operation, a flame can be maintained adjacent said flame tip member; means for introducing a sample gas to said flame; a generally cylindrical collector electrode; and means for maintaining an electrical potential for collecting on said collector electrode positive ions generated by ionization of said sample gas in said flame; said flame tip member being disposed coaxially with respect to and axially spaced apart from one end of said collector electrode so

that the spacing between said flame tip member and the bottom edge of said collector electrode is in the range from 1 millime-



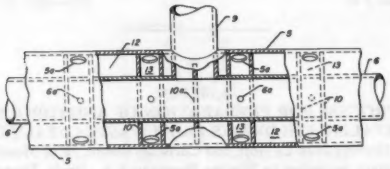
ter to 3 millimeter displaced; the inside diameter of said collector electrode being in the range from 0.114 inch to 0.3 inches.

4,182,741

FLUID DISTRIBUTOR FOR FIXED-BED CATALYTIC REACTION ZONES

Don B. Carson, Mt. Prospect, and Frank V. Purse, Northfield, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 9, 1978, Ser. No. 904,141
Int. Cl.² B01J *8/02*
U.S. Cl. 422—211 **8 Claims**



1. In a catalytic reaction chamber, containing a fixed-bed of catalyst particles, an inner catalyst fluid distribution device which comprises, in cooperative relationship:

(a) a fluid inlet conduit;

(b) a first plurality of spaced-apart, perforated fluid distribution conduits in open communication with said fluid inlet conduit and disposed in a plane perpendicular to the vertical plane containing the axis of said fluid inlet conduit;

(c) a second plurality of perforated fluid distribution conduits, having a nominal diameter greater than said first distribution conduits, one each of which is coaxially and concentrically disposed around each of said first distribution conduits; and

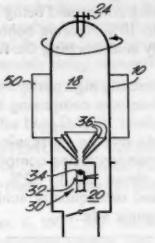
(d) annular-form, spaced-apart stabilizing discs, having a major diameter substantially the same as the internal diameter of said second distribution conduits, surrounding said first distribution conduits and disposed substantially perpendicular to the longitudinal axis thereof, said adjacent pairs of said stabilizing discs forming individual internal chambers, containing both first and second distribution conduit perforations, along the length of said first and second conduits, and said discs also providing for annular stagnant internal chambers between perforations to impede transfer of heat to the quench fluid.

4,182,742

CHEMICAL SYNTHESIS APPARATUS HAVING DIFFERENTIAL PUMPING MEANS

Malcolm L. H. Green, Oxford, and Peter Norgate, Sunbury on Thames, both of England, assignors to G. V. Planer Limited, Sunbury on Thames, England

Filed Jun. 20, 1977, Ser. No. 808,085
Claims priority, application United Kingdom, Jun. 19, 1976, 25538/76
Int. Cl.² B01J *1/00, 37/00*
U.S. Cl. 422—199 **13 Claims**



1. Chemical synthesis apparatus comprising: an evacuable chamber enclosing a reaction region and an evaporation region; evaporation means mounted in said evaporation region for producing a first chemical constituent; differential pumping means mounted in said chamber to separate said evaporation region from said reaction region, said differential pumping means, when said chamber is evacuated, maintaining residual gas pressure within said evaporation region at an appreciably lower pressure than within said reaction region and passing said evaporated first chemical constituent from said evaporation region into said reaction region, said differential pumping means comprising at least one hollow frustoconical member, means mounting said member with the smaller end thereof directly adjacent said evaporation means such that said first chemical constituent passes through said member before entering said reaction region; and inlet means mounted on said chamber for introducing a second chemical constituent into said reaction region.

4,182,743

FILTER MATERIAL FOR SELECTIVE REMOVAL OF ALDEHYDES FOR CIGARETTE SMOKE

Norman B. Rainer, and Irvin R. Feins, both of, Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 630,355, Nov. 10, 1975, abandoned. This application Mar. 3, 1977, Ser. No. 773,866
Int. Cl.² B01D *53/34*
U.S. Cl. 422—211 **10 Claims**

1. A filter element for selectively removing, rapidly and effectively, lower molecular weight aldehyde and related components from a gas stream containing unsaturated hydrocarbon components without substantially affecting such hydrocarbon components as does activated carbon, having a substrate consisting essentially of granules of a porous carrier, said carrier granules containing hydrogen peroxide, about one to ten percent water based on the weight of hydrogen peroxide, and a hydrophilic stabilizer for said hydrogen peroxide.

4,182,744

EXTRACTING COLUMBIUM-TANTALUM VALUES FROM PYROCHLORE ORES

Ralph H. Nielsen, and Patrick H. Payton, both of Albany, Oreg., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Aug. 4, 1978, Ser. No. 929,545
Int. Cl.[2] C01G 33/00
U.S. Cl. 423—68 10 Claims

1. A method of extracting high purity columbium oxide from calcium rich pyrochlore ores comprising fusing the ore with caustic soda and an inorganic fluorine containing compound, said fluorine containing compound being present in an amount of from above 2% to 10% fluorine content by weight of the ore, and subsequently acid leaching the fused mixture with an inorganic acid.

2. A method of extracting high purity columbium oxide from barium rich pyrochlore ores comprising treating the ore with calcium chloride at about 1000° C. and subsequently fusing the ore with caustic soda and an inorganic fluorine containing compound, said fluorine containing compound being present in an amount of from above 2% to 10% fluorine content by weight of the ore, and subsequently acid leaching the fused mixture with an inorganic adic.

4,182,745

CATALYST FOR REDUCING NITROGEN OXIDES IN A WASTE GAS AND A PROCESS FOR CATALYTICALLY REDUCING NITROGEN OXIDES CONTAINED IN A WASTE GAS

Fusao Nishida, Tokyo; Toshihiro Ueno; Tomiaki Yamada, both of Yokohama; Noriyuki Suzuki, Tokyo; Takehiko Takeda, Yokohama; Tsutomu Yanagihara, Tokyo; Katsuhiko Adachi, Yokohama; Tadashi Asanabe, Zushi; Katsuaki Ohsato, Yokohama; Kintaro Tsuda, Tokyo, and Keiichiro Watanabe, Yokohama, all of Japan, assignors to JGC Corporation, Tokyo, Japan

Continuation of Ser. No. 602,192, Aug. 6, 1975, abandoned. This application Oct. 17, 1977, Ser. No. 842,668
Claims priority, application Japan, Aug. 6, 1974, 49/89470
Int. Cl.[2] B01D 53/00
U.S. Cl. 423—239 A 16 Claims

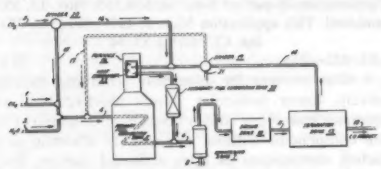
1. A process for reducing nitrogen oxides contained in waste gas to nitrogen with ammonia as a reducing agent at a temperature of from 250° C. to 450° C. in the presence of a solid catalyst on a support said catalyst being a heteropoly acid compound of a metal from the group consisting of the first transition metals of the periodic table and mixtures thereof, wherein the heteropoly acid is selected from the group consisting of silicotungstic acid, silicomolybdic acid, phosphotungstic acid and phosphomolybdic acid.

4,182,746

CARBON MONOXIDE MANUFACTURE

Myo Myint, Springfield, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 16, 1978, Ser. No. 916,324
Int. Cl.[2] C01B 31/18
U.S. Cl. 423—415 A 1 Claim



1. A process for generating carbon monoxide which includes the steps of:

converting methane feed to a mixture of carbon monoxide product and hydrogen by reaction with a gas mixture comprising carbon dioxide feed and steam in a primary fuel conversion zone;

converting carbon dioxide feed to carbon monoxide by reaction with a gas mixture comprising hydrogen in a secondary fuel conversion zone;

combining the effluents from the primary and secondary zones, and directing such combined effluents through a dewatering zone and a drying zone;

directing from the drying zone a gas stream consisting of carbon dioxide, hydrogen, methane, and carbon monoxide to a separation zone;

separating a carbon monoxide product stream from a recycle stream in said separation zone;

directing at least a portion of said recycle stream to said secondary fuel conversion zone;

directing at least a portion of the carbon dioxide feed to the secondary fuel conversion zone and a portion of the carbon dioxide feed to the primary fuel conversion zone;

maintaining the primary fuel conversion zone at a temperature within the range from about 200 to about 1000° C. at an average pressure within the range from about 3 to about 100 atmospheres, said primary fuel conversion zone containing sufficient nickel on refractory support to maintain an hourly weight space velocity within the range froom about 0.1 to about 10;

maintaining the secondary fuel conversion zone at a temperature within the range from about 600 to about 1000° C. at an average pressure within the range from about 3 to about 100 atmospheres said secondary fuel conversion zone containing sufficient catalyst characterized as a Group VIII metal on a refractory support to maintain an hourly weight space velocity within the range from about 2 to about 20;

and controlling the feed to provide substantially three mols of carbon dioxide per mol of methane.

4,182,747

PROCESS FOR PREPARATION OF ANHYDROUS METALLIC CHLORIDES FROM WASTE CATALYSTS

Guy Gravey; Jean Le Goff, and Christian Gonin, all of Moutiers, France, assignors to Metaux Speciaux S.A., Paris, France

Filed Dec. 20, 1977, Ser. No. 862,594
Claims priority, application France, Dec. 30, 1976, 76 39842
Int. Cl.[2] C01B 9/02
U.S. Cl. 423—491 18 Claims

1. A process for preparation from waste catalysts on an alumina support base which have been used for the treatment of hydrocarbons, of anhydrous metallic chlorides selected from the group consisting of chlorides of aluminum, molybdenum, vanadium, cobalt and nickel, comprising:

(a) separating hydrocarbons which impregnated the waste catalyst support base during use, under conditions wherein a major portion of carbon present in an uncombined state is not oxidized or removed from within the alumina support base;

(b) chlorinating the waste catalyst treated as in step (a) by subjecting the catalyst to a flow of gaseous chlorine at a temperature sufficient to sequentially reduce metal oxides present and form volatile and non-volatile chlorides of the reduced metals;

(c) passing a gaseous effluent of (b) through an anhydrous sodium chloride at a temperature of between about 115° C. to about 500° C. to selectively fix the aluminum chloride in the form of a complex salt or mixture of low melting point salts; and;

(d) at least recovering an aluminum chloride product.

4,182,748

MATERIAL AND METHOD FOR OBTAINING HYDROGEN AND OXYGEN BY DISSOCIATION OF WATER

Eugene R. Anderson, Wills Point, Tex., assignor to Horizon Manufacturing Corporation, Wills Point, Tex.

Filed May 4, 1978, Ser. No. 902,708
Int. Cl.[2] C01B 13/02, 1/07
U.S. Cl. 423—579 29 Claims

1. A material for the generation of hydrogen and oxygen from water which comprises an amalgam of an alkali metal, mercury and aluminum wherein the atomic ratio of alkali metal to mercury is from about 3:1 to about 1:1.5 and the atomic weight ratio of alkali metal to aluminum is from about 1:1 to about 3:1 combined with an alloy of platinum and at least one element selected from the group consisting of germanium, antimony, gallium, thallium, indium, cadmium, bismuth, lead, zinc and tin.

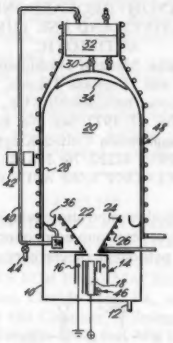
15. A process for the generation of hydrogen and oxygen from water which comprises contacting water with an amalgam of an alkali metal, mercury and aluminum wherein the atomic ratio of alkali metal to mercury is from about 3:1 to about 1:1.5 and the atomic weight ratio of alkali metal to aluminum is from about 1:1 to about 3:1 combined with a platinum-containing alloy.

4,182,749

CHEMICAL SYNTHESIS APPARATUS AND METHOD

Malcolm L. H. Green, Oxford, and Vivian J. Hammond, London, both of England, assignors to G. V. Planer Limited, Sunbury on Thames, England

Filed Dec. 20, 1977, Ser. No. 862,514
Claims priority, application United Kingdom, Dec. 23, 1976, 53705/76
Int. Cl.[2] B01J 1/00
U.S. Cl. 423—659 29 Claims



19. A method of chemical synthesis, comprising establishing an evaporation region and a reaction region within an evacuated chamber, establishing an evaporation source in said evaporation region, evaporating a first chemical constituent from said evaporation source in said evaporation region into said reaction region, introducing a second chemical constituent into said reaction region, maintaining the pressure within said evaporation region substantially lower than the pressure within said reaction region by differential pumping, removing said reacted first and second chemical constituents in admixture with unreacted second constituent from said reaction region and subsequently returning said removed constituents to said reaction region for reaction with a further quantity of said first constituent.

4,182,750

BLOODCOMPATIBLE FUNCTIONAL POLYMERS

Thomas E. Sullivan, 9308 Belmart Rd., Potomac, Md. 20854, and Oscar L. Wright, 11 Kathy La., Monroe, La. 71203

Filed Apr. 21, 1977, Ser. No. 789,498
Int. Cl.[2] A61K 29/00, 43/00
U.S. Cl. 424—1 14 Claims

1. Therapeutic materials made by chemically bonding to a base polymer formed by the vinyl polymerization of styrene, vinyl cholride, maleic anhydride, acrylic acid derivatives or nitrilo substitute ethylene, at least one substance ethylene, at least one substance selected from the group consisting of a modified protein, a carbohydrate, a nucleic acid, and a lipid, said substance being capable of transferring a desired ingredient to blood, biological fluid or tissue, upon contact therewith, these therapeutic materials being compatible with blood, biological fluid and tissue, and producing no undesirable effects.

4,182,751

NEW IMMUNOSTIMULANT MEDICAMENT AND PROCESS OF PREPARING SAME

Gerard Ayme, Lyon, France, assignor to Institut Merieux, Lyon, France

Filed Jun. 6, 1977, Ser. No. 804,150
Claims priority, application France, Jun. 4, 1976, 76 16937
Int. Cl.[2] A61K 39/02
U.S. Cl. 424—92 21 Claims

1. A process of making a medicament for the stimulation of non specific immunity which comprises

(a) extracting a bacteria capable of providing said stimulation at a temperature below 70° C. by means of a phenol extraction;

(b) collecting the phenol phase from said phenol extraction;

(c) eliminating said phenol to leave a substantially phenol-free bacteria extract

(d) rendering said extract water soluble and

(e) purifying an aqueous solution of said extract to render it free from endotoxin.

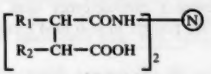
4,182,752

NEOCARZINOSTATIN DERIVATIVES AND A PROCESS FOR PRODUCING THE SAME

Hiroshi Maeda, Kumamoto; Ryunosuke Kanamaru, and Nakao Ishida, both of Sendai, all of Japan, assignors to Kayaku Antibiotic Research Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1978, Ser. No. 887,220
Claims priority, application Japan, Mar. 24, 1977, 52-32412
Int. Cl.[2] A61K 31/785; C08F 8/32
U.S. Cl. 424—78 3 Claims

1. A neocarzinostatin derivative of the formula:



Wherein (N) represents a neocarzinostatin nucleus, and R_1—CH(CO-)CH(COOH)—R_2 represents a polystyrene-maleic acid copolymer, said neocarzinostatin derivative being separable into high and low molecular weight fractions having acute toxicities in rats of about 1/50 and about 1/10 respectively in comparison to neocarzinostatin.

2. A method of inhibiting secondary metastasis of cancer cells which comprises administering an amount effective for said inhibition of the neocarzinostatin derivative of claim 1.

4,182,753

SARCOMA 180 TUMOR INHIBITOR AND METHOD OF MAKING SAME

Cora G. Saltarelli, 2323 Areca Rd., Boca Raton, Fla. 33432

Filed Mar. 29, 1978, Ser. No. 891,334
Int. Cl.[2] A61K 35/00
U.S. Cl. 424—115 5 Claims

1. The method of making a Sarcoma 180 tumor growth

inhibitor which comprises culturing *Candida albicans SA#1* (CBS 5736) microorganism in a chemical medium containing glucose for about 30 days at about 30° C., centrifuging the resulting growth medium, discarding the cells, precipitating the remaining filtrate with ethanol, and recovering the resulting glycoprotein of the precipitate.

4,182,754

ORAL INGESTION OF INDIUM

George A. H. Bonadio, 373 East Ave., Watertown, N.Y. 13601

Continuation-in-part of Ser. No. 732,491, Oct. 14, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 869,579

Int. Cl.[2] A61K *33/24, 31/28*

U.S. Cl. 424—131 **4 Claims**

1. A method of reducing or eliminating the need for thyroid hormone supplement in a human receiving such supplement by administering orally indium or a digestible compound thereof selected from the group consisting of indium acetate, indium carbonate, indium chelate, indium chloride, indium gluconate, indium phosphate, indium palmitate and indium sulphate in a daily average amount of about 0.25–25.0 mg.

4,182,755

FEED INTAKE CONTROL OF ANIMALS

Larry C. McNeff, Wayzata, Minn., assignor to Cargill Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 532,741, Dec. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 430,676, Jan. 4, 1974, abandoned. This application Mar. 3, 1976, Ser. No. 663,437

Int. Cl.[2] A61K *33/26, 33/14, 33/06*

U.S. Cl. 424—147 **20 Claims**

1. A complete feed formulation for domestic animals and poultry which reduces the feed intake when offered on a self-feeding basis, which feed formulation at the time of feeding comprises an admixture of feed nutrient materials and a feed intake control agent, said agent being chloride ion which is present in said feed formulation at a level of from about 1 percent to about 12 percent by weight in excess of the total level of monovalent cations other than ammonium and hydrogen which are present in said feed formulation.

19. A complete feed formulation for domestic animals and poultry which reduces the feed intake when offered on a self-feeding basis, which feed formulation at the time of feeding comprises an admixture of feed nutrient materials and a feed intake control agent, said agent being chloride ion which is present in said feed formulation in an amount of from about 0.25 percent to about 1 percent by weight in excess of the total amount of monovalent cations other than ammonium and hydrogen which are present in said feed formulation.

4,182,756

HIGH CALORIE SOLUTIONS OF LOW MOLECULAR WEIGHT GLUCOSE POLYMER MIXTURES USEFUL FOR INTRAVENOUS ADMINISTRATION

Anne B. Ramsay, Ingleside, Ill.; Delbert R. Luebke, Kenosha, Wis.; David T. Guzek, Wildwood, Ill.; Chia-Lung Hsieh; Robert Roteman, both of Waukegan, Ill., and William D. Leathem, Lindenhurst, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 21, 1977, Ser. No. 853,366

Int. Cl.[2] A61K *31/715;* **C07H** *1/00;* **C08B** *37/00*

U.S. Cl. 424—180 **46 Claims**

1. A substantially clear, nonpyrogenic, stable and sterile solution for intravenous administration to human patients, said solution comprising at least 20% W/V of a glucose polymer mixture having an average degree of polymerization of at least 4 and at least 99% of its molecules less than 26 glucose units, at least 85% of its molecules less than 11 glucose units, and at least 20% of its molecules less than 4 glucose units.

4,182,757

NOVEL NITROSOUREA COMPOUNDS AND PROCESS FOR PREPARING THE SAME

Kenji Tsujihara, Urawa; Masakatsu Ozeki, Wako, and Yoshihisa Arai, Urawa, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

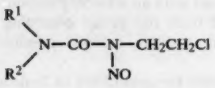
Filed Jul. 10, 1978, Ser. No. 922,811

Claims priority, application Japan, Jul. 29, 1977, 52/91674; Sep. 22, 1977, 52/114259; Feb. 2, 1978, 53/11225; May 16, 1978, 53/58560; May 26, 1978, 53/63459

Int. Cl.[2] A61K *31/70;* **C07H** *15/02*

U.S. Cl. 424—180 **47 Claims**

1. A compound of the formula:



wherein R^1 is a group selected from the class consisting of alkyl of one to six carbon atoms, hydroxyalkyl of one to six carbon atoms, alkenyl of three to five carbon atoms and alkynyl of three to five carbon atoms, R^2 is a group selected from the class consisting of D-glucopyranosyl, D-galactopyranosyl, D-mannopyranosyl, D-xylopyranosyl, L-arabinopyranosyl, O-α-D-glucopyranosyl-(1→4)-D-glucopyranosyl and a group of the formula: $—CH_2(CHOH)_nCH_2OH$, and n is zero or an integer of one to four.

44. A therapeutic composition which comprises a therapeutically effective amount of the compound claimed in claim **1** and a pharmaceutically acceptable carrier therefor.

47. A method of treating transplanted tumors or leukemia in a warm blooded animal comprising administering to said animal a therapeutically effective amount of the compound of claim **1**.

4,182,758

HYDROXYAMINOHYDROCARBONPHOSPHONIC ACID DERIVATIVES AND USE THEREOF AS AN ANTIBIOTIC

Takashi Kamiya, Suita; Masashi Hashimoto, Takarzuka; Keiji Hemmi, Tsuzuki, and Hidekazu Takeno, Nara, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

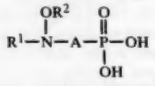
Filed Jul. 27, 1977, Ser. No. 819,554

Claims priority, application United Kingdom, Jul. 27, 1976, 31339/76; Oct. 11, 1976, 42222/76; Jun. 20, 1977, 25700/77

Int. Cl.[2] C07F *9/40;* **A01N** *9/36*

U.S. Cl. 424—211 **61 Claims**

1. A pharmaceutical composition which comprises, as an effective ingredient, at least one compound having antibacterial activity against pathogenic bacteria of the formula:



wherein

R^1 is hydrogen or the acyl moiety of an organic carboxylic acid

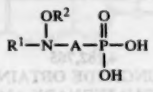
R^2 is hydrogen, or the acyl moiety of an organic carboxylic acid, and

A is lower alkylene, lower alkenylene or hydroxy(lower-)alkylene, or the pharmaceutically acceptable salt thereof excepting 3-(N-acetyl-N-hydroxyamino)propylphosphonic acid, 3-(N-acetyl-N-hydroxyamino)-2-hydroxypropylphosphonic acid, and their pharmaceutically acceptable salts with a pharmaceutically acceptable carrier.

5. A method of treating a host containing an infectious disease caused by pathogenic bacteria which comprises treating

the host with a therapeutically effective amount of the composition of claim 1.

12. A compound of the formula:



wherein

R^1 is hydrogen or acyl,

R^2 is hydrogen, ar(lower) alkyl or acyl, and

A is lower alkylene, lower alkenylene or hydroxy(lower) alkylene, or the esters at the phosphono group thereof or the pharmaceutically acceptable salts thereof, excepting 3-(N-acetyl-N-hydroxyamino)propylphosphonic acid, 3-(N-acetyl-N-hydroxyamino)-2-hydroxypropylphosphonic acid, and their pharmaceutically acceptable salts, wherein each of said acyl groups is the acyl moiety of an organic carboxylic acid.

4,182,759
ARYLALKYL AND ARYLOXYALKYL PHOSPHONATES AND USE AS ANTIVIRAL AGENTS

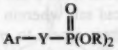
Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,502

Int. Cl.² A01N 9/36; C07F 9/40

U.S. Cl. 424—217 **15 Claims**

1. A compound having the formula



wherein

Ar is phenyl or phenyl substituted by one or two substituents selected from the group consisting of halogen, lower-alkoxy of 1 to 4 carbon atoms, hydroxy, alkanoyloxy of 1–4 carbon atoms, carbo-lower-alkoxy of 2–4 carbon atoms, carbamyl and carboxy;

Y is $(CH_2)_n$ or $O(CH_2)_n$ wherein n is an integer from 6 to 8; and R is alkyl of 1–6 carbon atoms.

2. A method for combatting viruses which comprises contacting the locus of said viruses with an antivirally effective amount of at least one compound according to claim 1.

4,182,760
BENZOPHENONE ANTI-OXIMES, DIAZEPIN-N-OXIDES, AND THEIR USE AS PHARMACEUTICAL AGENTS AND AS INTERMEDIATES FOR PHARMACEUTICAL AGENTS

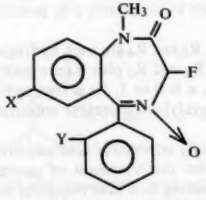
William J. Middleton, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 16, 1977, Ser. No. 807,075

Int. Cl.² C07D 243/24; C07C 103/34; A61K 31/55, 31/165

U.S. Cl. 424—244 **36 Claims**

7. A compound of the formula:



where

X is Cl, Br, NO_2 or CF_3; and

Y is H, Br, Cl or F.

19. A pharmaceutical composition comprising a pharmaceutically suitable carrier and an effective tranquilizing amount of a compound of claim 7.

4,182,761
ACYLOXY-SUBSTITUTED ARYLOXYALKYL DIKETONES

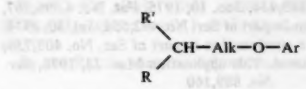
Joseph C. Collins, East Greenbush, and Guy D. Diana, Stephentown, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 725,160, Sep. 21, 1976, Pat. No. 4,133,959, which is a continuation-in-part of Ser. No. 576,311, May 12, 1975, Pat. No. 4,031,246, which is a continuation-in-part of Ser. No. 381,406, Jul. 23, 1973, Pat. No. 3,933,837. This application Jun. 7, 1978, Ser. No. 913,453

Int. Cl.² C07C 69/76, 69/78; A61K 31/235, 31/535

U.S. Cl. 424—248.55 **9 Claims**

1. A compound of the formula



wherein:

Alk is alkylene of 3 to 10 carbon atoms;

R and R′ are alkanoyl of 2 to 6 carbon atoms;

and Ar is phenyl substituted by an acyloxy group of 1 to 10 carbon atoms, and optionally further substituted by a halogen atom, said acyloxy group being derived from a carboxylic acid having a molecular weight less than 200.

8. A composition for combatting viruses which comprises an antivirally effective amount of at least one compound according to claim 1 in admixture with a suitable carrier or diluent.

9. A method for combatting viruses which comprises contacting the locus of said viruses with a composition containing an antivirally effective amount of at least one compound according to claim 1 in admixture with a suitable carrier or diluent.

4,182,762
DIOXOPIPERAZINE DERIVATIVES SUITABLE FOR USE AS MEDICAMENTS AND β-LACTAM ANTIBIOTIC INTERMEDIATES

Michael Preiss, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

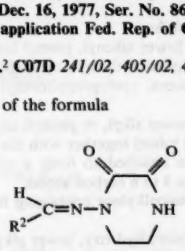
Filed Dec. 16, 1977, Ser. No. 861,473

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1976, 2657559

Int. Cl.² C07D 241/02, 405/02, 409/02

U.S. Cl. 424—250 **12 Claims**

1. A compound of the formula



in which R^2 is a straight-chain or branched alkyl radical with 1 to 6 carbon atoms, a phenyl radical, a phenyl radical which is substituted by halogen, alkyl with 1 to 4 carbon atoms, alkyoxy with 1 to 4 carbon atoms, nitro, cyano, hydroxyl, alkylsulphonyl with 1 to 4 carbon atoms, or methoxycarbonyl, or a furyl, thienyl or isoxazolyl radical, or a furyl, thienyl or isoxazolyl radical which is substituted by halogen or alkyl with 1 to 4 carbon atoms.

4,182,763

BUSPIRONE ANTI-ANXIETY METHOD

George P. Casten; Gordon R. McKinney; Roger E. Newton; E. Crosby Tompkins, all of Evansville, and John H. Weikel, Jr., Mt. Vernon, all of Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed May 22, 1978, Ser. No. 908,597
Int. Cl.[2] A61K *31/505*
U.S. Cl. 424—251 9 Claims

1. A method for the palliative treatment of neurosis in which anxiety symptoms are prominent which comprises administering a non-toxic anxiolytically effective dose of buspirone or a pharmaceutically acceptable acid addition salt thereof to a neurotic patient.

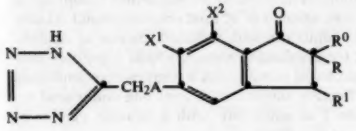
4,182,764

TETRAZOLE DERIVATIVES OF [1-OXO-2-ARYL OR THIENYL-2-SUBSTITUTED-5-INDANYLOXY(OR THIO)]ALKANOIC ACIDS

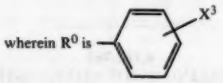
Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 585,434, Jun. 10, 1975, Pat. No. 4,096,267, which is a continuation-in-part of Ser. No. 492,651, Jul. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 405,736, Oct. 11, 1973, abandoned. This application Mar. 23, 1978, Ser. No. 889,160
Int. Cl.[2] A61K *31/475, 31/235;* C07D *257/04*
U.S. Cl. 424—262 11 Claims

6. A pharmaceutical composition useful in the treatment of edema and hypertension which also maintains uric acid at pretreatment levels or causes a decrease in uric acid levels which comprises a therapeutically effective amount of a compound of the formula:



wherein R^0 is



or

A is oxygen or sulphur;

R is lower alkyl, lower alkenyl, phenyl lower alkyl, phenyl lower alkenyl, phenyl, thienyl, cycloalkyl having from 3 to 6 carbon atoms, cyclopropylmethyl or cyclopentylmethyl;

R^1 is hydrogen, lower alkyl, or phenyl; or

R^1 and R may be joined together with the carbon atoms to which they are attached to form a cycloalkylene ring containing from 3 to 6 carbon atoms;

Y is alkylene or haloalkylene containing from 1 to about 4 carbon atoms;

X^3 is hydrogen, nitro, hydroxy, lower alkyl, lower alkoxy, cyclopentyl, cyclohexyl, halo, amino, cyano, sulfamoyl, methanesulfonyl, chlorosulfonyl, aminomethyl, acetamido or chloroacetylaminomethyl;

X^7 is hydrogen, lower alkyl or halogen;

X^8 is hydrogen or lower alkyl;

X^1 is hydrogen, halo or methyl;

X^2 is halo, methyl or trihalomethyl; or

X^1 and X^2 may be joined together to form a hydrocarbylene chain containing from 3 to about 4 carbon atoms;

and the non-toxic, pharmacologically acceptable salt thereof, and a pharmaceutically acceptable carrier.

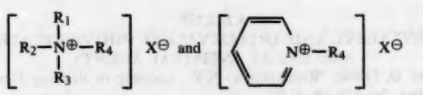
4,182,765

OIL SOLUBLE FUNGICIDE OBTAINED FROM THE REACTION OF A QUATERNARY AMMONIUM SALT AND AN ALKYL BENZENE SULFONIC ACID

Osami Yagi, Tokyo, and Yasuo Fujiwara, Yokohama, both of Japan, assignors to Nippon Oil Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 375,025, Jun. 29, 1973, abandoned. This application May 6, 1976, Ser. No. 683,932
Int. Cl.[2] A01N *9/22;* C07D *213/04*
U.S. Cl. 424—263 14 Claims

1. An oil soluble fungicide obtained from the process which comprises reacting an aqueous solution of a least one quaternary ammonium salt of the general formula



in which R_1 of the quaternary cation is a benzyl radical, R_2 and R_3 of said cation each represent an aliphatic hydrocarbon radical of from 1 to 8 carbon atoms, R_4 of said cation is an aliphatic hydrocarbon radical of from 8 to 20 carbon atoms, and the anion X^- is derived from a salt-forming acid, with an alkyl benzene sulfonic acid salt wherein the alkyl moiety contains from 10 to 14 carbon atoms to provide an oil soluble quaternary ammonium sulfonate fungicide.

10. An oil containing from about 10 to 10,000 ppm of an oil soluble fungicide prepared by the process of claim 1.

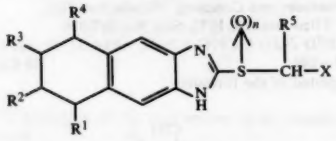
4,182,766

NAPHTH[2,3-d]IMIDAZOLES

Anna Krassó, Basel, and Ernst-Peter Krebs, Bottmingen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 11, 1978, Ser. No. 941,343
Claims priority, application Luxembourg, Sep. 19, 1977, 78140; Switzerland, Jul. 28, 1978, 8149/78
Int. Cl.[2] A61K *31/44;* C07D *235/02*
U.S. Cl. 424—263 11 Claims

1. A compound of the formula

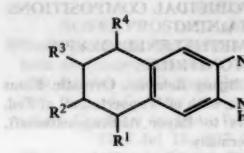


I

wherein R_1, R_2, R_3 and R_4 are each hydrogen or both of the pairs R_1 plus R_2 and R_3 plus R_4 are additional carbon to carbon bonds, n is 0 or 1, R_5 is hydrogen or lower alkyl and X is 2-pyridyl or 2-pyridyl substituted by a lower alkyl group,

or a pharmaceutically acceptable acid addition salt thereof.

11. A method for the treatment of gastric ulcers which comprises administering to a host requiring such treatment as effective amount of compound of the formula



wherein R_1, R_2, R_3 and R_4 are each hydrogen or both of the pairs R_1 plus R_2 and R_3 plus R_4 are additional carbon to carbon bonds, n is 0 or 1, R_5 is hydrogen or lower alkyl and X is 2-pyridyl or 2-pyridyl substituted by a lower alkyl group,

or a pharmaceutically acceptable acid addition salt thereof.

4,182,767
ANTIHYPERGLYCEMIC N-ALKYL-3,4,5-TRIHYDROXY-2-PIPERIDINE METHANOL

Hiromu Murai, Otsu; Hiroshi Enomoto, Nagaokakyo; Yoshiaki Aoyagi, Kyoto; Yoshiaki Yoshikuni, Kameoka; Masahiro Yagi, Kusatsu, and Ichiro Shirahase, Kyoto, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

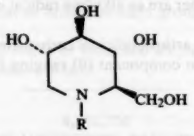
Filed May 10, 1978, Ser. No. 906,233

Claims priority, application Japan, Jun. 25, 1977, 52-075936

Int. Cl.[2] A61K *31/445;* **C07D** *211/46*

U.S. Cl. 424—267 **7 Claims**

1. A compound selected from the group consisting of an N-alkylpiperidine of the formula:



wherein R is alkyl of 1 to 4 carbon atoms, and the pharmaceutically acceptable nontoxic acid addition salts thereof.

6. The method of effecting an antihyperglycemic effect in humans and other animals which comprises administering thereto an antihyperglycemically effective amount of a compound according to claim 1.

4,182,768
PROPHYLAXIS OR TREATMENT OF THROMBOSES AND INHIBITION OF PLATELET AGGREGATION IN HUMAN BLOOD

Barbara Nunn, Sutton, and Keith H. Baggaley, Redhill, both of England, assignors to Beecham Group Limited, England

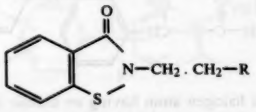
Filed May 30, 1978, Ser. No. 910,292

Claims priority, application United Kingdom, May 31, 1977, 22903/77

Int. Cl.[2] A61K *31/425, 31/445*

U.S. Cl. 424—267 **17 Claims**

1. A method of treating thromboses in humans which comprises administering to a human in need thereof a therapeutically effective amount of a compound of the formula (II):



(II)

or a pharmaceutically acceptable acid addition salt thereof wherein R is 1-piperidyl or 1-pyrrolidyl.

4,182,769
ANTI-INFLAMMATORY 1-SUBSTITUTED-4,5-DIARYL-2-(SUBSTITUTED-THIO) IMIDAZOLES AND THEIR CORRESPONDING SULFOXIDES AND SULFONES

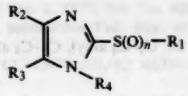
Saul C. Cherkofsky, Wilmington, Del., and Thomas R. Sharpe, Fort Salonga, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 767,219, Feb. 9, 1977, abandoned. This application Jan. 5, 1978, Ser. No. 865,831

Int. Cl.[2] C07D *233/84, 405/04;* **A61K** *31/415*

U.S. Cl. 424—273 R **50 Claims**

1. A compound of the formula

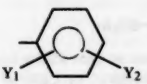


where

n=0, 1, or 2;

R_1=C_1–C_6 alkyl; allyl; vinyl; —CH_2COCH_3; —$CH_2S(O)_mCH_3$, where m=0, 1, or 2; mono- and polyhalo- C_1–C_4 alkyl;

R_2 and R_3, the same or different=



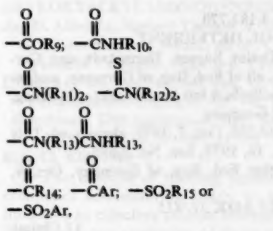
Y_1 and Y_2, the same or different=hydrogen, C_1–C_4 alkoxy, C_1–C_4 alkyl, Cl, F, CF_3, NH_2, —$N(CH_3)_2$, NO_2, CH_3S—, CH_3SO_2—, or Y_1 and Y_2 taken together forming a dioxymethylene bridge;

provided, when R_1=C_1–C_4 alkyl, C_3–C_4 haloalkyl with halogen substituted at the 3 or 4 position, allyl, or acetonyl, both Y_1 and Y_2 cannot be H;

R_4=C_1–C_6 alkyl, allyl, $CH_2CH_2N(R_5)_2$,

2-tetrahydropyranyl,

2-tetrahydrofuranyl,



where

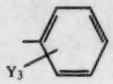
R_5=methyl or ethyl;

R_6=H or methyl;

R_7=C_1–C_3 alkyl, benzyl, -$CH_2CH_2OCH_3$

R_8=C_1–C_4 alkyl or benzyl;

R_9=C_1–C_4 alkyl or benzyl;
R_{10}=C_1–C_6 alkyl;
R_{11}=H, methyl or ethyl;
R_{12}=H, methyl or ethyl;
R_{13}=C_1–C_6 alkyl;
R_{14}=C_1–C_6 alkyl;
R_{15}=C_1–C_4 alkyl;
Ar=



where

Y_3=H, F, Cl, Br, C_1–C_4 alkyl, C_1–C_4 alkoxy or nitro; provided when

R_4 = $-\overset{O}{\overset{\|}{C}}OR_9$, $-\overset{O}{\overset{\|}{C}}NHR_{10}$,
$-\overset{O}{\overset{\|}{C}}N(R_{11})_2$, $-\overset{S}{\overset{\|}{C}}N(R_{12})_2$,
$-\overset{O}{\overset{\|}{C}}N(R_{13})\overset{O}{\overset{\|}{C}}NHR_{13}$, $-\overset{O}{\overset{\|}{C}}R_{14}$,
$-\overset{O}{\overset{\|}{C}}Ar$; $-SO_2R_{15}$ or $-SO_2Ar$,

then n must be 0.

31. A method of treating arthritis in a mammal in need of such treatment which comprises administering to the mammal an effective antiarthritic amount of a compound of claim **1**.

4,182,770

ALCOHOL DETERRENT

Ahmad Behpour, Berlin; Detlev Kayser, Darmstadt, and Gerhard Martin, Wiesbaden, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 840,203, Oct. 7, 1977, abandoned. This application Jan. 16, 1979, Ser. No. 3,695

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645709

Int. Cl.[2] **A61K** *31/415*

U.S. Cl. 424—273 R **12 Claims**

1. A method of deterring a human from consuming alcohol which comprises administering to a human whose intake of alcohol is to be lessened, successive doses of 1-(4-nitrophenyl)-2-methyl-4-nitroimidazole at least until the consumption of alcohol by the human is substantially reduced.

12. A method of deterring a human from consuming alcohol which comprises administering to a human whose intake of alcohol is desired to be lessened, an amount of 1-(4-nitrophenyl)-2-methyl-4-nitroimidazole effective for deterring the human from the consumption of alcohol.

4,182,771

SYNERGISTIC ARTHROPODICIDAL COMPOSITIONS CONTAINING α-SUBSTITUTED-3,4-METHYLENEDIOXYPHENYLACETONITRILES

Volker Mues, Wuppertal; Wolfgang Behrenz, Overath; Klaus Ditgens, and Thomas Schmidt, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

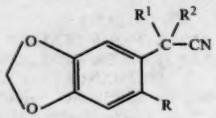
Filed Nov. 14, 1977, Ser. No. 851,571

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654348; Jan. 15, 1977, 2701586

Int. Cl.[2] **A01N** *9/28, 9/20, 9/02*

U.S. Cl. 424—282 **17 Claims**

1. An arthropodicidal composition containing as active compounds (i) a benzodioxole of the formula



in which

R is hydrogen, alkyl or alkenyl with up to 6 carbon atoms, halogen or nitro,

R^1 is alkyl with 1 to 3 carbon atoms or hydrogen, and

R^2 is aryl-C_{1-3}-alkyl, alkyl or alkenyl with up to 6 carbon atoms, or cycloalkyl with 3 to 8 carbon atoms, or may represent hydrogen provided that R represents alkyl, alkenyl or nitro, or

R^1 and R^2 together are an alkylene radical with 2 to 8 carbon atoms,

and (ii) at least one arthropodicidal carbamate, the weight ratio of component (i) to component (ii) ranging from about 0.1:10 to 10:0.1.

4,182,772

SYNERGISTIC COMBINATIONS OF AMITRAZ AND CERTAIN PYRETHROIDS

John S. Badmin, Isle of Sheppey, and Robert J. Knight, Ashford, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 10, 1978, Ser. No. 932,889

Claims priority, application United Kingdom, Aug. 10, 1977, 33524/77

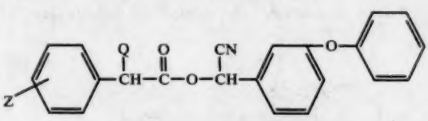
Int. Cl.[2] **A01N** *9/02*

U.S. Cl. 424—304 **5 Claims**

1. A pesticidal composition comprising as active ingredients:

(a) N,N-di-(2,4-xylyliminomethyl)methylamine

(b) an acaricidally active α-cyanobenzyl phenylacetate compound having the formula



(I)

in which Z is a halogen atom having an atomic number of from 9 to 35, inclusive, or an alkoxy group containing from 1 to 4 carbon atoms and Q is an alkyl group containing from 1 to 6 carbon atoms, wherein the ratio of (a):(b) is from 1:1 to 5:1.

4,182,773

NOVEL PROSTAGLANDIN DERIVATIVES

Wilhelm Bartmann, Bad Soden am Taunus; Ulrich Lerch, Hofheim am Taunus; Hermann Teufel; Bernward Scholkens, both of Kelkheim, and Gerhard Beck, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

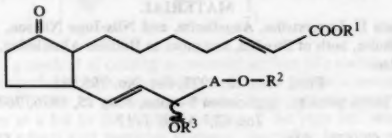
Filed Jul. 15, 1977, Ser. No. 816,207

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632097; Jan. 21, 1977, 2702370

Int. Cl.[2] C07C *177/00;* A61K *31/19, 31/215*

U.S. Cl. 424—305 2 Claims

1. A compound of the formula



wherein

R^1 is hydrogen or a linear or branched, saturated or unsaturated aliphatic or cycloaliphatic radical having from 1 to 8 carbon atoms, or an araliphatic radical having from 7 to 9 carbon atoms, or a physiologically tolerable metal, NH_4 or substituted ammonium ion derived from a primary, secondary or tertiary amine;

R^2 is a linear or branched, saturated or unsaturated aliphatic hydrocarbon radical having from 1 to 8 carbon atoms;

R^3 is hydrogen or a R^4CO group wherein R^4 is a hydrogen atom or a linear or branched alkyl group having up to 10 carbon atoms;

A is a saturated, linear or branched alkylene group having from 2 to 5 carbon atoms.

4,182,774

METHOD OF INHIBITING BLOOD PLATELET AGGREGATION WITH 2-AMINO-3-(5- AND 6-)BENZOYLPHENYLACETIC ACIDS, ESTERS AND METAL SALTS THEREOF

William J. Welstead, Jr., and Henry W. Moran, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

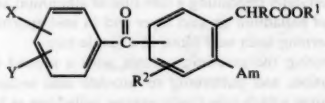
Continuation of Ser. No. 788,057, Apr. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 604,371, Aug. 13, 1975, Pat. No. 4,045,576, which is a continuation-in-part of Ser. No. 487,499, Jul. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 354,625, Apr. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 254,285, May 17, 1972, abandoned. This application Feb. 17, 1978, Ser. No. 879,025

The portion of the term of this patent subsequent to Aug. 30, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/24, 31/195*

U.S. Cl. 424—309 1 Claim

1. A method of producing an inhibitory effect on blood platelet aggregation in a living animal body which comprises administering to said living animal body a blood platelet inhibitory effective amount of a compound having the formula:



wherein;

R is hydrogen or lower alkyl,

R^1 is hydrogen, lower alkyl, sodium or potassium,

R^2 is hydrogen, halogen or lower alkoxy,

X is hydrogen, lower alkyl, halogen, nitro or trifluoromethyl,

Y is hydrogen, lower alkyl, halogen, nitro or trifluoromethyl, and

Am is primary amino (—NH_2) or dimethylamino.

4,182,775

BENZOIC ACIDS AND PROCESS FOR THEIR PREPARATION

Rudi Weyer, Kelkheim; Volker Hitzel, Hofheim am Taunus, and Ernold Granzer, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

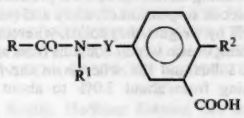
Filed Sep. 1, 1977, Ser. No. 829,876

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639935

Int. Cl.[2] C07C *101/42;* A01N *9/20*

U.S. Cl. 424—319 9 Claims

1. Benzoic acids of the general formula I



I

in which

R represents

(a) a phenyl radical which may be mono-, di- or trisubstituted by alkyl having 1 to 3 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkenoxy having 3 to 4 carbon atoms, CF_3 or halogen,

(b) a phenyl radical which may be mono- or disubstituted by halogen, alkyl or alkoxy having 1 to 4 carbon atoms each and which is linked with CO via Z, Z being a methylene group which may be substituted by halogen, alkoxy having 1 to 4 carbon atoms or a vinyl group or,

(c) a thiophene radical which may be mono- or disubstituted by alkyl having 1 to 3 carbon atoms, alkoxy hving 1 to 4 carbon atoms, or halogen,

R^1 is hydrogen or alkyl having up to 4 carbon atoms, Y is a saturated hydrocarbon radical having 1 to 3 carbon atoms, R^2 is alkyl having 1 to 4 carbon atoms, or halogen, as well as the physiologically tolerable salts and esters thereof.

4,182,776

METHOD OF TREATING LIPIDEMIA WITH ARYLOXYALKYLAMINOBENZOIC ACIDS AND ESTERS

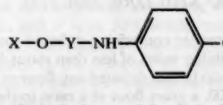
Jay D. Albright, Nanuet; Thomas G. Miner, Chester, and Robert G. Shepherd, South Nyack, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 760,600, Jan. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 639,018, Dec. 9, 1975, abandoned. This application Mar. 30, 1978, Ser. No. 891,654

Int. Cl.[2] A61K *31/445, 31/38, 31/34;* C07C *101/60*

U.S. Cl. 424—319 10 Claims

1. The method of treating lipidemia in a mammal which comprises administering orally to a mammal afflicted with lipidemia an effective amount therefor of a compound selected from the group consisting of those of the formula:



wherein Y is a branched or straight chain alkylene group of the formula C_nH_{2n} wherein n is 2 to 12, R_1 is selected from the group consisting of hydrogen, lower alkyl, di(lower alkyl)-aminoethyl, 2,3-dihydroxypropyl, 2-(lower al-

kanoylamino)ethyl and 1-methyl-4-piperidyl, X is selected from the group consisting of phenyl, naphthyl, thienyl, furyl, 1,2,3,4-tetrahydronaphthyl, 4-chloro-1-naphthyl and substituted phenyl wherein the phenyl substituents are halogen, hydroxy, lower alkoxy, lower alkyl, cyano, trihalomethyl, amino, lower alkanoylamino, lower alkylamino, di(lower alkyl)amino, phenoxy, p-chlorophenoxy, benzyloxy, p-chlorobenzyloxy or cycloalkyl; the pharmacologically acceptable acid-addition salts thereof; and the pharmacologically acceptable cationic salts thereof when R_1 is hydrogen.

4,182,777

CO-DRIED YEAST WHEY FOOD PRODUCT AND PROCESS

Elmer J. Saunders, Downers Grove, and Terry A. Lappin, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 1, 1977, Ser. No. 773,205
Int. Cl.[2] A23B *4/04*
U.S. Cl. 426—62 **18 Claims**

1. A process for making an improved food product comprising, forming an aqueous suspension of whey and yeast which contains 20% to 50% by weight whey solids, wherein the yeast is in the form of a yeast cream which contains from about 10% to 20% by weight solids and the whey is in the form of a suspension containing from about 3.0% to about 70% by weight solids,

spray drying the thus formed suspension, and recovering the spray dried free flowing product.

10. A process for making an improved food product, forming an aqueous suspension of whey and *Candida utilus* which contains 20% to 50% by weight whey solids wherein the *Candida utilis* is in the form of a yeast cream which contains from about 10% to about 20% by weight solids and the whey is in the form of a suspension containing from about 3.0% to about 70% by weight solids,

spray drying the thus formed suspension, and recovering the spray dried free flowing product.

4,182,778

ENCAPSULATION OF VITAMIN AND MINERAL NUTRIENTS

Harlan S. Hall, Black Earth, and Ralph E. Pondell, Madison, both of Wis., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 17, 1978, Ser. No. 906,541
Int. Cl.[2] A23L *1/30*
U.S. Cl. 426—72 **9 Claims**

1. A micro-encapsulated malleable nutrient product which is compatible with food systems and free of offensive odor and taste in aqueous systems comprising a finely divided vitamin or mineral nutrient coated by a matrix comprising a major amount of ethyl cellulose together with propylene glycol mono-ester and acetylated monoglyceride said matrix comprising 4%–60%by weight of the product.

4,182,779

EGG YOLK EXTENDER

William B. Chess, Monsey, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 5, 1977, Ser. No. 857,053
The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.
Int. Cl.[2] A21D *13/08*; A23L *1/32*
U.S. Cl. 426—558 **41 Claims**

1. An egg yolk extender comprising defatted soy flour having a protein dispersibility index of less than about 60; an edible food grade oil in a ratio to said defatted soy flour of from about 18:100 to about 40:100, a grain flour in a ratio to the combined weight of said defatted soy flour and said oil within the range of from about 1:10 to about 1:1 and lecithin being present in a ratio to the combined weight of said defatted soy flour and said oil within the range of from about 1:100 to about 20:100, the oil and lecithin providing a total lipid content in the final egg yolk extender of from about 14% to about 24% by weight, and from about 0.5 parts to about 3 parts by weight per 100 parts of the combined weight of said defatted soy flour and said oil of a food grade gum selected from the group consisting of alginates, carrageenan, guar, xanthan and mixtures thereof, all ratios being on a weight basis.

4,182,780

PROCESS AND AN APPARATUS FOR ALKALI-TREATMENT OF LIGNOCELLULOSIC MATERIAL

Gösta B. Lagerström, Ängelholm, and Nils-Inge Nilsson, Billesholm, both of Sweden, assignors to Boliden Aktiebolag, Sweden

Filed May 10, 1977, Ser. No. 795,511
Claims priority, application Sweden, May 25, 1976, 7605943
Int. Cl.[2] A23K *1/12*
U.S. Cl. 426—636 **2 Claims**

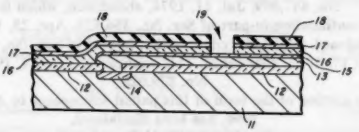
1. A process for increasing the feed value of lignocellulosic materials by alkali-treatment and subsequent neutralization with an acid in a closed system under circulation of the treating agents, which comprises sprinkling concentrated alkali onto a mass of the material followed by sprinkling water for dilution-absorption onto the mass at a rate essentially corresponding to the absorption of treating agent by the lignocellulosic material and supplying the acid for neutralization in the form of a concentrate, whereby the quantity of residual solution resulting from the treatment is minimized.

4,182,781

LOW COST METHOD FOR FORMING ELEVATED METAL BUMPS ON INTEGRATED CIRCUIT BODIES EMPLOYING AN ALUMINUM/PALLADIUM METALLIZATION BASE FOR ELECTROLESS PLATING

Robert C. Hooper, Houston; Alexander J. Harrover, Missouri City; Michael J. VanHoy, Stafford, and Charles E. Terry, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 21, 1977, Ser. No. 835,385
Int. Cl.[2] C23C *3/02*
U.S. Cl. 427—90 **7 Claims**



1. A method for the metallization of a semiconductor integrated circuit, comprising the steps of:

(a) forming an insulation layer on the semiconductor, said layer having apertures at locations for ohmic contact to said semiconductor;

(b) sequentially depositing a thin film of aluminum and a thin film of palladium on said layer and in said apertures;

(c) patterning both said films; in a single step

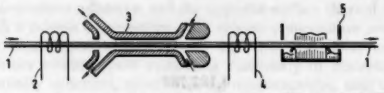
(d) covering the resulting pattern with a second layer of insulation, and patterning to provide said second layer apertures which selectively expose palladium at locations on said pattern where metal bumps are desired; then

(e) plating the exposed palladium with a suitable metal for bump formation, by electroless plating and continuing the plating until a bump of sufficient height is formed.

4,182,782
METHOD OF A COATING ON THE OUTSIDE SURFACE OF A METAL PIPE

Werner Scheiber, Frankfurt am Main, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 616,314, Sep. 24, 1975, abandoned. This application May 15, 1978, Ser. No. 906,128
Int. Cl.[2] B05D 3/02
U.S. Cl. 427—195 1 Claim



1. In a method of coating an external surface of a metal pipe with a synthetic resin comprising heating the pipe to a temperature sufficient to permit particles of said synthetic resin to adhere as a frit to the external surface of the pipe but below that at which said particles coalesce, thereafter heating said pipe to a temperature higher than the first-mentioned temperature and sufficient to cause the frit to coalesce and form a smooth coating on said external surface, and cooling said pipe, the improvement which comprises in combination:

(a) heating the pipe to a temperature of 140° to 210° C.;

(b) passing the heated pipe through a chamber at a speed of about 20 m/min, said chamber supplied with a turbulent air stream homogeneously charged with 1.0 to 2.0 kg/m^3 of a thermoplastic synthetic resin powder selected from the group of polyamides, polyethylene and polyvinyl chloride constituting said particles;

(c) blowing the mixture of said air stream and said particles over along and parallel in countercurrent to the surface of the pipe at a velocity of 30 to 80 m/sec, thereby maintaining a relative velocity between pipe and the air stream containing the powder of about 50 m/sec;

(d) charging said synthetic resin powder into said air stream with a grain size from 20 to 80 microns, the thickness of the fritted synthetic resin amounting to 140 to 240 microns;

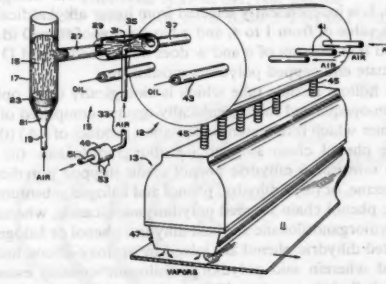
(e) heating said pipe to a temperature of 190° to 240° C.; and

(f) cooling the coated pipe following step (e) and obtaining a thickness of the smooth coating of 120 to 200 microns.

4,182,783
METHOD OF VAPOR DEPOSITION

Vern A. Henery, Plum Borough, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 23, 1977, Ser. No. 836,177
Int. Cl.[2] C23C 11/00, 13/12
U.S. Cl. 427—248 B 11 Claims



1. In a method of coating a substrate with a film by deposition from a reactant composition wherein the reactant composition is caused to react at a surface of the substrate by maintaining the substrate at a temperature sufficient to cause pyrolysis of the reactant composition upon its contact therewith, the improvement which comprises

fluidizing a mass of particulate solid coating reactant with a gas at a temperature substantially below the reaction temperature, decomposition temperature or vaporization temperature of the reactant;

drawing a volume of fluidizing gas and suspended particulate solid reactant from the fluidized mass as a particulate reactant-gas composition;

mixing the withdrawn volume of particulate reactant-gas composition with an additional volume of gas to dilute the particulate reactant-gas composition while maintaining the temperature of the mixture below the reaction temperature, decomposition temperature or vaporization temperature of the reactant; and

directing the mixture against a substrate dispersing the solid reactant over a surface of it while maintaining the substrate at a sufficient temperature to cause the solid reactant to react depositing a film.

4,182,784
METHOD FOR ELECTROLESS PLATING ON NONCONDUCTIVE SUBSTRATES USING PALLADIUM/TIN CATALYST IN AQUEOUS SOLUTION CONTAINING A HYDROXY SUBSTITUTED ORGANIC ACID

Gerald A. Krulik, Hoffman Estates, Ill., assignor to McGean Chemical Company, Inc., Cleveland, Ohio

Filed Dec. 16, 1977, Ser. No. 861,385
Int. Cl.[2] C23C 3/02
U.S. Cl. 427—304 5 Claims

1. A method of rendering the surface of a non-conductive substrate catalytic to the electroless deposition of metal including the step of:

contacting the surface of said substrate with an aqueous solution obtained by (a) dissolving a stannous salt in an aqueous solution containing a hydroxy substituted organic acid and (b) reacting said stannous salt while in said solution with a palladium salt, with one or both of said palladium and said stannous salts being a salt other than a halide salt, with any halide ion present being derived from said palladium or said stannous salt.

4,182,785
PROCESS FOR IMPROVING RHEOLOGY OF CLAY SLURRIES

William M. Price, St. Austell, England, assignor to Anglo-American Clays Corporation, Sandersville, Ga.

Filed Apr. 6, 1978, Ser. No. 894,041
Int. Cl.[2] B44D 1/44; C04B 31/40
U.S. Cl. 427—361 15 Claims

1. In the process for producing a refined kaolin clay pigment by forming a crude kaolin clay into an aqueous slurry, and reductive bleaching the slurry with an alkali metal hydrosulfite to solubilize and chemically reduce iron-containing discolorants in the crude clay and thereby improve the brightness of said clay; a method enabling reduction of viscosity in a slurried product including said pigment, comprising:

adding to said bleached slurry at a solids content of at least 50% by weight, a source of barium ion, to thereby precipitate at least the sulfate ion present in said slurry in consequence of oxidation of the hydrosulfite ion during said bleaching step; said processing of said crude kaolin through said bleaching step being effected at low solids content, said at least 50% solids content being thereafter achieved by filtration; and said barium ion being added to said slurry in the presence of dispersants, to achieve in combination therewith a minimum viscosity in the thereby treated slurry.

12. In the process for producing a coated paper by applying to a base paper a coating composition including a kaolin clay pigment and a binder, and then calendering the coated base

paper; the improvement enabling improved gloss and reflectivity characteristics in the said coated paper, comprising:

incorporating as said pigment a refined kaolin clay pigment which has been prepared by the method which includes forming a crude kaolin clay into an aqueous slurry, reductive bleaching the slurry with an alkali metal hydrosulfite to solubilize and chemically reduce iron-containing discolorants in the crude clay and thereby improve the brightness of said clay; and adding to said bleached slurry at a solids contents of at least 50% by weight, a source of barium ion, to thereby precipitate at least the sulfate ion present in said slurry in consequence of oxidation of the hydrosulfite ion during said bleaching step; and said barium ion being added to said slurry in the presence of dispersants to achieve in combination therewith a minimum viscosity in the thereby treated slurry.

4,182,786

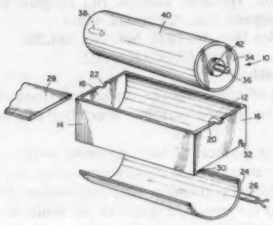
SKI HOT WAX APPLICATOR

Terry J. Hertel, 20065 Northwind Sq., Cupertino, Calif. 95014

Continuation of Ser. No. 802,041, May 31, 1977, which is a division of Ser. No. 631,552, Nov. 13, 1975, Pat. No. 4,029,046, which is a continuation of Ser. No. 459,492, Apr. 10, 1974, abandoned. This application Aug. 4, 1978, Ser. No. 930,889

Int. Cl.[2] **B05D** *1/28*

U.S. Cl. 427—428 **1 Claim**



1. A method for applying melted wax to the bottom of a ski comprising the steps of:

heating normally solid ski wax to substantially two hundred and fifty degrees Farenheit to three hundred degrees Farenheit to form a liquid bath in an open tub having a substantially semi-circular bottom wall with an exterior surface and planar end walls by applying generally uniform, two-dimensional heat to the tub through a heater mounted to the exterior surface of the tub bottom wall, to melt said ski wax without substantially altering the chemical composition of the wax by overheating;

heating by conduction the outer most surface of the freely rotatably solid roller to substantially two hundred degrees Farenheit to two hundred and twenty-five degrees Farenheit, said roller having oppositely directed axial struts adapted to engage the tub end wall, said conduction heating being through the heated end walls and roller struts to the roller and through the liquid wax bath partially immersing only the lower radial surface of the roller, said roller, struts and tub end walls being constructed of a heat-conductive material and said roller including heat conducting means connecting the axial struts to the radial surface such that a preselected portion of heat from the end walls is conducted through the axial struts to the outer most radial surface of the roller to maintain melted wax in the open tub between the temperatures given in the step of heating said ski wax;

translating a ski across said roller with the ski bottom surface in tangential contact with the outer most surface of the roller, said outer most radial surface comprising a continuous resilient, deformable silicon rubber covering of about one-eighth inch thickness and having a softness in the range of thirty to fifty durometers, to rotatably advance the roller through the hot wax bath, to heat and to open the pores of the ski bottom surface passing over the bath; and

applying by means of the rotating roller uniformly contacting the width of the ski bottom a layer of sheeted wax melt to uniformly fill the pores in the ski bottom.

4,182,787

OPTICALLY TRANSPARENT, RADIOGRAPHICALLY OPAQUE TUBING

John C. Goossens, Mt. Vernon, Ind., and Richard E. Molari, Jr., Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Jun. 19, 1978, Ser. No. 917,062

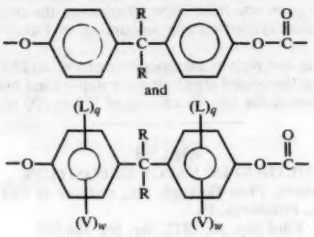
Int. Cl.[2] **A61M** *25/00;* **F16L** *11/04, 11/12*

U.S. Cl. 428—36 **15 Claims**

1. A hollow flexible tube which is biologically inert optically non-opaque and radiographically opaque fabricated from a terpolymer represented by the general formula

$$A\,([C]_n\,[D]_m)_a\,Y$$

wherein A is selected from the group consisting of hydrogen and a phenyl radical; Y is selected from the group consisting of OH and a phenoxy radical; n has a value of from 1 to about 20; m has a value of from 1 to about 10; a has a value from 1 to about 30; C is a carbonate polymer containing the following two units, in random fashion,



wherein R is independently selected from monovalent hydrocarbon radicals, V is independently selected from halogen radicals, L is independently selected from lower alkyl radicals, W has a value of from 1 to 4, and q has a value of from 0 to 2, provided that the sum of q and w does not exceed 4, and D is a carbonate end-capped polydiorganosiloxane.

11. A hollow flexible tube which is biologically inert, optically non-opaque and radiographically opaque comprised of a terpolymer which is the intercondensation product of: (A) (i) a dihydric phenol chain stopped polydiorganosiloxane, (ii) a halogen substituted dihydric phenol chain stopped polydiorganosiloxane, or (iii) a dihydric phenol and halogen substituted dihydric phenol chain stopped polydiorganosiloxane, wherein said polydiorganosiloxane and said dihydric phenol or halogen substituted dihydric phenol are joined by aryloxy-silicon linkages and wherein said polydiorganosiloxane consists essentially of dialkylsiloxy units which are connected to each other by silicon-oxygen-silicon linkages wherein each of the silicon atoms has two organo radicals attached through a carbon-silicon bond; (B) a dihydric phenol; (C) a halogen substituted dihydric phenol; and (D) a carbonyl halide.

4,182,788

MICROCAPSULAR RELEASE SYSTEM

Anthony E. Vassiliades, Deerfield, and David N. Vincent, Glenview, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 230,088, Feb. 28, 1972, Pat. No. 4,075,389. This application Nov. 11, 1977, Ser. No. 850,536

Int. Cl.[2] A61F *13/02*

U.S. Cl. 428—40 15 Claims

1. A pressure-sensitive adhesive sheet which comprises a substrate having a surface thereof coated with a tacky, pressure-sensitive adhesive, and the opposite surface thereof coated with a release composition, said release composition comprising three separate ingredients, said first ingredient being a primary release agent consisting essentially of discrete, substantially spherical, air-containing microcapsules, said second ingredient being binder for adhering said microcapsules to said sheet, and said third ingredient being between about 1 and about 30 percent by weight of said air-containing microcapsules on a dry basis of a secondary release agent, said secondary release agent improving the release properties of said release composition as compared with said release composition omitting said secondary release agent.

6. An opaque release sheet which comprises a substrate having a surface thereof coated with a tacky, pressure-sensitive adhesive, and the opposite surface thereof coated with a release composition, said release composition comprising a primary release agent consisting essentially of discrete, substantially spherical, air-containing microcapsules and an effective amount of a secondary release agent, said secondary release agent being a member selected from the group consisting of polyethylene, a methoxysilane, a silicone-polyglycol copolymer and a Werner complex of a fatty acid.

11. A laminate comprising a first component comprising a substrate carrying a first layer comprising a release coating which comprises three separate ingredients, said first ingredient being a primary release agent consisting essentially of discrete, substantially spherical, air-containing microcapsules, said second ingredient being binder for adhering said microcapsules to said sheet, and said third ingredient being between about 1 and about 30 percent by weight of said air-containing microcapsules on a dry basis of a secondary release agent, said secondary release agent improving the release properties of said release composition as compared with said release composition omitting said secondary release agent, and a second component comprising a substrate having a tacky, pressure-sensitve adhesive coating, wherein said tacky pressure-sensitive adhesive coating is adherred to said first layer.

4,182,789

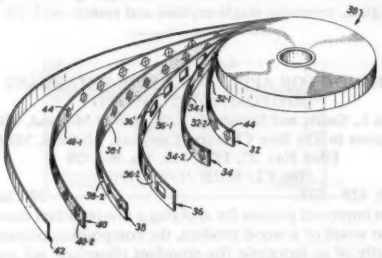
MULTI-LAYER GRAPHIC ARTS TAPE SYSTEM

James M. Castelluzzo, New York, N.Y., assignor to T.M. Invention Associates, New York, N.Y.

Filed Aug. 3, 1978, Ser. No. 930,700

Int. Cl.[2] B41L *1/28, 1/36;* B32B *3/10;* C09J *7/02*

U.S. Cl. 428—40 14 Claims



1. A multi-layer graphic arts tape system comprising a first clear tape having an adhesive coating on a first surface thereof, a second clear tape having a first surface in facing relationship with the second surface of said first tape and having an adhesive coating on the second surface thereof, a separator strip having a first surface in facing relationship with said second surface of said second tape, a third clear tape having an adhesive coating on a first surface thereof in facing relationship with the second surface of said separator strip, said separator strip containing holes therein for allowing said adhesive coatings on said second surface of said second tape and said first surface of said third tape to adhere to each other in the regions of said holes, an adhesive disposed between said second surface of said first tape and said first surface of said second tape and having a bonding force which is less than that provided by the adhesive coating on each of said first and second tapes when each of said tapes is applied to an application surface, and a plurality of markings on each of said first, second and third tapes aligned with each other.

4,182,790

LIQUID ALKYLACRYLAMIDES AND RELATED COMPOSITIONS

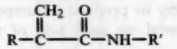
Claude J. Schmidle, Trenton, N.J., assignor to Thiokol Corporation, Newtown, Pa.

Filed Mar. 20, 1978, Ser. No. 888,459

Int. Cl.[2] B05D *3/06*

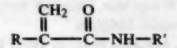
U.S. Cl. 428—260 8 Claims

1. An ultraviolet radiation curable composition comprising a compound of the formula:



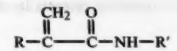
wherein R is hydrogen or methyl and R′ is an α-methyl substituted straight chain alkyl radical of from 5 to 10 carbon atoms or a poly-branched alkyl radical of from about 6 to about 18 carbon atoms; and an ultraviolet radiation cure accelerator.

8. A process for the preparation of an article of manufacture comprising a substrate coated or impregnated on at least one surface thereof with a radiation cured coating or impregnant comprising the reaction products of a compound of the formula:



wherein R and R′ are as defined in claim 1 which comprises:

a. coating or impregnating a substrate on at least one surface with a compound of the formula:



wherein R and R′ are as defined herein; and

b. treating the coated or impregnated substrate of step a above with electron beam or ultraviolet radiation.

4,182,791

PROCESS FOR MAKING A COMPOSITE BODY

Otto Meyering, Am Friedhof, 4286 Oeding, and Wilhelm Schmidt, Eichendorffstrasse 5, 4280 Borken, both of Fed. Rep. of Germany

Filed Mar. 24, 1978, Ser. No. 889,916

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2713989

Int. Cl.[2] B32B *27/04, 27/42*

U.S. Cl. 428—248 11 Claims

1. Process for making a composite member having a portion

of thermoplastics material and a portion of thermosetting material comprising the steps of:

(i) impregnating fabric with a liquid thermosetting material;

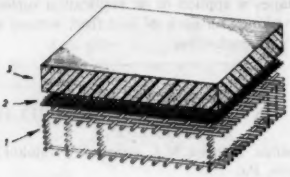
(ii) drying the impregnated fabric;

(iii) piling the dried impregnated fabric in the form of sheets to form a thermoset assembly;

(iv) applying on at least one surface of the thermoset assembly a layer having a serrated surface;

(v) applying to the said serrated surface the thermoplastics material in particular form;

(vi) applying pressure and heat to a composite assembly so formed to cure the thermosetting laminate, fuse the thermoplastics material and bond the composite assembly together in the desired form.



3. Process as claimed in claim 1 including the further steps between steps (v) and (vi) of superposing an additional layer having a serrated surface directly on the surface of the thermoplastics material and then applying a further assembly of dried fabric impregnated with thermosetting material on said additional layer whereby to produce a composite member with thermosetting material on each side of the thermoplastics material.

4. Process as claimed in claim 1 including the additional step (v') between steps (v) and (vi) of pressing the materials together to form a coherent body.

4,182,792

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

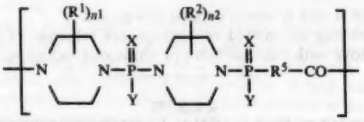
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 23, 1978, Ser. No. 918,249

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] C08G *79/02*

U.S. Cl. 528—332 **10 Claims**

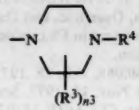
1. A solid polymer consisting essentially of repeating units of the formula:



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group; or —OR or —NH_2; or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula:



wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or a heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group;

(iv) n^1, n^2, and n^3 each represent zero or an integer; and

(v) R^5 represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon radical, or an N-containing heterocyclic radical.

4,182,793

PIEZOELECTRIC CRYSTALLINE FILM OF ZINC OXIDE

Hiroshi Nishiyama, Mukou; Toshio Ogawa, and Tasuku Mashio, both of Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Jun. 8, 1978, Ser. No. 913,803

Claims priority, application Japan, Jun. 9, 1977, 52/68454; Jun. 9, 1977, 52/68455; Jun. 13, 1977, 52/70150; Jun. 13, 1977, 52/70151

Int. Cl.[2] C23C *15/00*; C04B *35/00*

U.S. Cl. 428—432 **11 Claims**

1. A piezoelectric crystalline film having a wide applicable range from low to high frequencies on a substrate, said film consisting essentially of a crystalline zinc oxide film with a hexagonal crystal structure and a c-axis substantially perpendicular to the substrate surface, said crystalline zinc oxide film containing one copper compound selected from the group consisting of copper sulphide, copper telluride, copper selenide, copper selenate, copper phosphide and copper phosphate the concentration of copper being 0.01 to 20.0 atomic percent.

11. A piezoelectric crystalline film according to claim 1 wherein the substrate is selected from the group consisting of metal, glass, ceramics, single crystals and resin.

4,182,794

METHOD FOR APPLYING A FIRE-RETARDANT COMPOSITION TO WOOD

William L. Smith, and Robert H. Lalk, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 27, 1978, Ser. No. 963,728

Int. Cl.[2] B32B *21/04, 21/06*

U.S. Cl. 428—537 **28 Claims**

1. An improved process for applying a fire-retardant composition to wood or a wood product, the composition consisting essentially of an inorganic fire-retardant phosphate salt and a binder of a poly-2-oxazoline having a weight average molecular weight of at least about 1,000 and at least about 40 percent

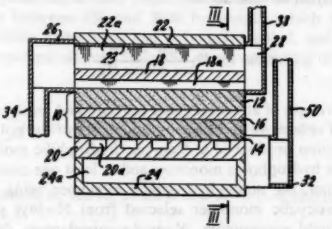
phosphorylated, the process comprising applying to the wood or wood product a fire-retardant amount of a solution of the composition, the improvement comprising admixing with the composition either prior to or simultaneously with the application of the composition to the wood or wood product an anionic or nonionic organic phosphate ester surfactant compatible with the solution of the composition and in an amount sufficient to increase the rate and extent of penetration of the composition into the wood or wood product.

4,182,795

FUEL CELL THERMAL CONTROL AND REFORMING OF PROCESS GAS HYDROCARBONS

Bernard S. Baker, Brookfield Center, and Dilip J. Dharia, Danbury, both of Conn., assignors to Energy Research Corporation, Danbury, Conn.

Filed Jul. 10, 1978, Ser. No. 923,370
Int. Cl.[2] H01M 8/18
U.S. Cl. 429—13 **31 Claims**



1. A method for operating an electrochemical cell to produce electrical energy from electochemical reaction between a cell electrolyte and a gas containing a hydrocarbon supplied from a gas supply to a flow passage in said cell in flow communication with said electrolyte, including the steps of:

(a) establishing a further flow passage for gas from said supply through said cell isolated from said electrolyte and in thermal communication with a heat-generating surface of said cell;

(b) disposing catalyst promoting endothermic reforming of such hydrocarbon content of said gas in such electrolyte-isolated passage; and

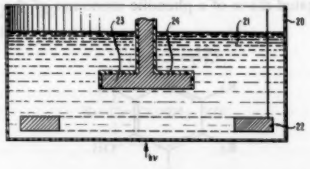
(c) conducting gas from said supply through both such electrolyte-communicative passage and said electrolyte-isolated passage.

4,182,796

SEMICONDUCTOR LIQUID JUNCTION PHOTOCELL USING SURFACE MODIFIED GaAs ELECTRODE

Adam Heller, Bridgewater; Barry Miller, Murray Hill, and Bruce A. Parkinson, New Providence, all of N.J.

Filed May 18, 1978, Ser. No. 907,396
Int. Cl.[2] H01M 6/30, 6/36
U.S. Cl. 429—111 **4 Claims**



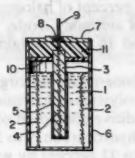
1. A photocell containing an n-type electrode, said n-type electrode comprising gallium arsenide, and a liquid electrolyte containing a redox couple comprising selenide anions, said n-type electrode having a surface in contact with said electrolyte, CHARACTERIZED IN THAT said surface further contains at least one material selected from the group consisting of Ru, Co, and Rh, said material being present in an amount greater than one-tenth of a monolayer and less than five monolayers, said material altering surface states initially within the bandgap of said gallium arsenide and reducing recombination.

4,182,797

PRIMARY BATTERY UTILIZING IODINE CHARGE TRANSFER COMPLEX HAVING A QUATERNARY AMMONIUM GROUP

Shigeo Kondo; Nobuyuki Yoshilke, both of Hirakata, and Masakazu Fukai, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation-in-part of Ser. No. 724,744, Sep. 17, 1976, abandoned. This application Jun. 5, 1978, Ser. No. 912,257
Claims priority, application Japan, Sep. 17, 1975, 50-112914; Jul. 9, 1976, 51-82350
Int. Cl.[2] H01M 6/18
U.S. Cl. 429—191 **13 Claims**



1. A primary battery which comprises: an anode material comprising lithium; a cathode material comprising an iodine containing charge transfer complex having a quaternary ammonium group, said complex having the formula:

$$A^{n1+}{}_{n2}(B\text{-}I_x)^-$$

wherein A denotes a quaternary heterocyclic nitrogen compound; B, an atom which forms a monovalent anion; n_1, the valence number of the cation of the quaternary heterocyclic nitrogen compound; n_2, the number of anions contained, being a real number equal to n_1; I, iodine; x, the number of iodine atoms contained, being a real number larger than 1, and a solid electrolyte comprising lithium iodide which is produced between said cathode material and said anode material by bringing said anode material into direct contact with said cathode material.

4,182,798

PREFORMED POLYMER SHEET IN COMBINATION WITH THE ANODE OF ELECTROCHEMICAL CELLS

Paul M. Skarstad, Wayzata, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 13, 1978, Ser. No. 885,514
Int. Cl.[2] H01M 6/18
U.S. Cl. 429—213 **36 Claims**

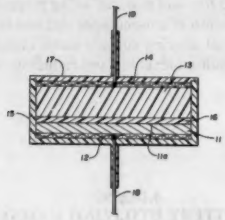
1. An electrochemical cell comprising:

an anode;

a cathode; and

a preformed body comprising P2VP in self-supporting form

interposed between the anode and cathode, the body contacting the cathode and also contacting the anode at



least initially upon assembly of the cell and prior to any electrolyte-forming discharge.

4,182,799

FLAME-RETARDANT ADDITIVE FOR FOAMED POLYSTYRENE

John Rodish, 1720 Highland Pike, Fort Wright, Ky. 41011

Filed Jun. 9, 1978, Ser. No. 914,001
Int. Cl.[2] C08J *9/00, 9/14;* C09K *3/28*
U.S. Cl. 521—98 **12 Claims**

1. A flame-retarding additive for foamed polystyrene comprising 40 to 56 weight percent of halogenated hydrocarbon, 9 to 15 weight percent of antimony oxide, 14 to 22 weight percent of zinc borate, and 16 to 23 weight percent of alumina hydrate.

7. A light-weight flame-retarding organic polymer shape comprising a foamed polystyrene extrusion having uniformly dispersed therein an additive composed of 40 to 56 percent by weight of halogenated hydrocarbon, 9 to 15 percent by weight of antimony oxide, 14 to 22 percent by weight of zinc borate, and 16 to 28 percent by weight of alumina hydrate.

4,182,800

METHOTREXATE-DIVINYL ETHER—MALEIC ANHYDRIDE COPOLYMER REACTION PRODUCT

Helmut Ringsdorf, and Michael Przybylski, both of Mainz, Fed. Rep. of Germany, assignors to Hercules Incorporated, Wilmington, Del.

Filed Jun. 28, 1978, Ser. No. 920,312
Claims priority, application United Kingdom, Jul. 16, 1977, 29957/77; Apr. 1, 1978, 12820/78
Int. Cl.[2] C08F *8/30*
U.S. Cl. 525—375 **3 Claims**

1. The reaction product of methotrexate and divinyl ether—maleic anhydride copolymer produced by reacting methotrexate with an excess of the anhydride form of divinyl ether—maleic anhydride copolymer in an inert cosolvent at a temperature above 0° C., said copolymer containing divinyl ether to maleic anhydride in a mole ratio of 1:2.

4,182,801

METHOD OF DRYING LIQUID OLEFIN MONOMER FEED IN A MOLECULAR SIEVE DRYER IN THE POLYMERIZATION OF OLEFINS FROM LIQUID OLEFIN MONOMER

Constantine D. Miserlis, Arlington, and Peter J. Lewis, Andover, both of Mass., assignors to The Badger Company, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 728,074, Sep. 30, 1976, abandoned. This application Jan. 17, 1978, Ser. No. 870,117
Int. Cl.[2] C08F *4/66, 10/00*
U.S. Cl. 526—77 **6 Claims**

1. In a method of catalytically polymerizing olefins from liquid olefin monomer using a Ziegler catalyst and employing a molecular sieve dryer to dry said liquid olefin monomer, said dryer having a plurality of beds of water adsorbing material cyclically switched on and off stream for regeneration of the off-stream bed to remove the water adsorbed thereby during its previous on-stream cycle, and in which the off-stream bed is regenerated by heating the same and flowing a regenerating gas through the heated bed without any steam pretreatment, comprising passing through the off-stream bed as a regenerating gas a fuel gas required in any event for providing energy elsewhere in the system.

4,182,802

HYDROPHILIC POLYMERS AND CONTACT LENSES OF HIGH WATER CONTENT

Samuel Loshaek, and Chah M. Shen, both of Chicago, Ill.

Filed Dec. 27, 1977, Ser. No. 864,275
Int. Cl.[2] C08F *212/08;* G02C *7/04*
U.S. Cl. 526—264 **13 Claims**

1. A contact lens adapted for extended wear hydrated to a water content of about 60% to 95% and having an oxygen permeability of at least about

$$15 \times 10^{-11} \frac{\text{cm}^2 \text{ ml } O_2}{\text{sec ml mm Hg}}$$

a tensile strength of at least about 2 kg/cm^2, and an elongation at break of at least 40% consisting essentially of the polymerization reaction product of at least one hydrophilic monomer, at least one hydrophobic monomer and at least one cross-linking monomer, the major hydrophilic monomer being an N-vinyl heterocyclic monomer selected from N-vinyl pyrrolidone, N-vinyl succinimide, N-vinyl-ε-caprolactam, N-vinyl pyridine, N-vinyl glutarimide, or mixtures thereof, the major hydrophobic monomer being selected from styrene, ring-substituted styrenes, or mixtures thereof, and the cross-linking monomer being selected from monomers containing two or more polymerizable double bonds per monomer unit.

4,182,803

ELASTOMER

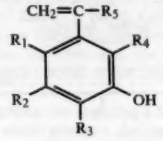
Shuichi Kanagawa, Osaka, and Tamotsu Miki, Ichihara, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 529,938, Dec. 5, 1974, Pat. No. 3,993,714. This application Jun. 10, 1976, Ser. No. 694,537
Claims priority, application Japan, Mar. 22, 1974, 49-32766; Jun. 7, 1973, 48-64559
Int. Cl.[2] C08F *216/02*
U.S. Cl. 526—313 **22 Claims**

1. A modified elastomer having a phenolic hydroxyl group on the side chain, characterized in that the modified elastomer is obtained by polymerizing

(a) at least one conjugated diene selected from the group consisting of butadiene, isoprene, 1,3-pentadiene, and chloroprene, with

(b) 0.5 to 10 parts by weight per 100 parts by weight of said conjugated diene of a phenolic monomer of the formula



wherein R_1, R_2, R_3, R_4, and R_5 are individually an alkyl group or a hydrogen atom.

4,182,804

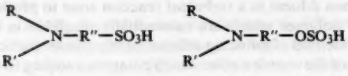
PREPARATION OF POLYMERS WHICH CONTAIN AMINE GROUPS OR SALTS THEREOF AND/OR QUATERNARY AMMONIUM GROUPS AND POLYMERS OBTAINED

Giancarlo Serboli, Saronno; Maurizio Straziota, Milan, and Nicolina La Barba, San Donato Milanese, all of Italy, assignors to Anic S.p.A., Palermo, Italy

Filed Nov. 1, 1977, Ser. No. 847,426
Claims priority, application Italy, Nov. 11, 1976, 29235 A/76
Int. Cl.[2] C08F *8/30, 8/32, 8/36*
U.S. Cl. 525—56 12 Claims

1. A method for producing a polymer which contains free primary, secondary or tertiary amine groups or salts thereof and/or quaternary ammonium groups, the polymer having good processability characteristics, which method consists essentially of the step of:

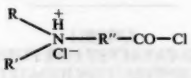
reacting a polymer containing at least one hydroxyl group in the polymer with an organic compound containing both an acidic and an amine group, said hydroxyl-containing polymer selected from the group consisting of an ethylenevinylacetate copolymer with a vinylacetate content between 3% and 50% by weight which has been partially hydrolyzed and polyvinyl alcohol, said organic compound selected from the group consisting of:


(a)

wherein R, R′ are H, or alkyl and R″ is $(-CH_2)$ n, n being 1 or 2.

(b) carboxylic acids of heterocyclic compounds containing one nitrogen atom; and

(c) chlorides-hydrochlorides of acids, with the basic groups described above having the formula:



wherein R, R′ are H, or alkyl and R″ is $(-CH_2)$n, n being an integer between 1 and 5.

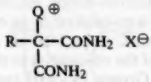
4,182,805

DECYANATION

Howard C. Haas, Arlington, Mass., and Robert D. Moreau, Nashua, N.H., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 725,571, Sep. 22, 1976, Pat. No. 4,110,424, which is a continuation-in-part of Ser. No. 627,373, Oct. 30, 1975, abandoned. This application Jun. 1, 1978, Ser. No. 911,445
Int. Cl.[2] C08F *8/30*
U.S. Cl. 525—336 3 Claims

1. A polymeric compound of the structure



where Q is a polyvinyl pyridinium, R is hydrogen or a n-alkyl group containing from one to twenty carbon atoms inclusive and X is bromide, chloride or iodide.

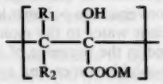
4,182,806

PROCESS FOR THE MANUFACTURE OF SALTS OF POLY-ALPHA-HYDROXYACRYLIC ACIDS

Nöel Vanlautem, Wavre, and Julien Mulders, Dworp, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Apr. 18, 1978, Ser. No. 897,647
Claims priority, application Luxembourg, Apr. 25, 1977, 77195
Int. Cl.[2] C08F *8/06, 8/44*
U.S. Cl. 525—369 4 Claims

1. Process for the manufacture of a salt of a poly-alpha-hydroxyacrylic acid, which salt contains monomeric units of the formula:



in which R_1 and R_2 independently represent hydrogen or an alkyl group containing from 1 to 3 carbon atoms, and in which M represents the cationic radical resulting from the dissociation of a base, by reacting, with the base, in the presence of water, a solid polylactone derived from the corresponding poly-alpha-hydroxyacrylic acid, in which process the reaction is carried out in liquid medium containing water and a diluent, the diluent being one which does not dissolve the polylactone and the salt produced and being present in an amount such that the polylactone and salt produced do not dissolve in the medium, comprising: adding an oxidizing agent to the liquid medium.

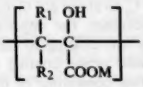
4,182,807

PROCESS FOR THE MANUFACTURE OF SALTS OF HYDROXYCARBOXYLATED POLYMERS OF REDUCED MOLECULAR WEIGHT

Nöel Vanlautem, Wavre; Julien Mulders, Dworp, and Jacques Gilain, Brussels, all of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Apr. 18, 1978, Ser. No. 897,648
Claims priority, application Luxembourg, Apr. 25, 1977, 77196
Int. Cl.[2] C08F *8/06, 8/44, 8/50*
U.S. Cl. 525—387 11 Claims

1. Process for the manufacture of a salt of a hydroxycarboxylated polymer of reduced molecular weight, starting from a corresponding polymer salt of higher molecular weight, said hydroxycarboxylated polymer contains monomeric units of the formula:



in which R_1 and R_2 represent hydrogen or an alkyl group containing from 1 to 3 carbon atoms which can be substituted by a hydroxyl group or by a halogen atom, R_1 and R_2 being identical or different, and in which M represents an alkali metal atom or an ammonium group, said process comprising: reacting the polymer salt of higher molecular weight with an oxidizing agent in the presence of a solvent.

4,182,808

INVERSION POLYMERIZATION PROCESS FOR PRODUCING VINYL RESINS USING A DUAL LAYER COATING

Paul O. Hong, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 25, 1978, Ser. No. 936,656
Int. Cl.[2] C08F 2/18, 2/32, 14/06
U.S. Cl. 526—62 17 Claims

1. In a process of inversion polymerizing substantially water-insoluble polymerizable ethylenically unsaturated monomer(s) in a reaction vessel by first forming a continuous monomer(s) phase in the presence of a monomer-soluble surface active agent and a monomer-soluble catalyst, polymerizing said monomer phase at a temperature in the range of about 25° C. to about 85° C. until a conversion to polymer less than about 20% occurs, adding sufficient water to the monomerpolymer mixture with agitation and in the presence of at least about 0.1% by weight of a water-soluble suspending agent for said monomer(s) to form a dispersion wherein water is the continuous phase, then polymerizing the dispersion at a temperature in the range of about 30° C. to about 80° C. to convert the remaining monomer(s) to polymer, the improvement which comprises (1) applying a prime coating to the internal surfaces of said reaction vessel, said prime coating comprising a condensation product selected from the group consisting of (a) the self-condensation product of a polyhydric phenol, (b) the condensation product of two or more polyhydric phenols, and (c) the self-condensation product of a polyhydric naphthol, (2) applying to said prime coating a top coating of a water-soluble suspending agent, (3) polymerizing the continuous monomer(s) phase in constant contact with said top coating, and (4) polymerizing said continuous water phase in constant contact with said prime coating after dissolving said top coating in the continuous water phase, whereby polymer buildup on said internal surfaces is substantially eliminated.

4,182,809

INVERSION POLYMERIZATION PROCESS FOR PRODUCING VINYL RESINS USING A DUAL LAYER COATING

Paul O. Hong, Avon Lake, Ohio; James R. Petrillo, Louisville; Teresa L. Friel, Jeffersontown, both of Ky., and Donald E. Witenhafer, North Olmstead, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 5, 1978, Ser. No. 939,623
Int. Cl.[2] C08F 2/18, 2/32, 14/06
U.S. Cl. 526—62 18 Claims

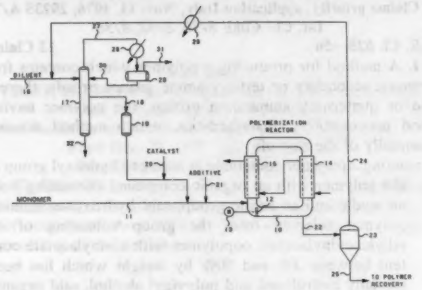
1. In a process of inversion polymerizing substantially water-insoluble polymerizable ethylenically unsaturated monomer(s) in a reaction vessel by first forming a continuous monomer(s) phase in the presence of a monomer-soluble surface active agent and a monomer-soluble catalyst, polymerizing said monomer phase at a temperature in the range of about 25° C. to about 85° C. until a conversion to polymer less than about 20% occurs, adding sufficient water to the monomerpolymer mixture with agitation and in the presence of at least about 0.1% by weight of a water-soluble suspending agent for said monomer(s) to form a dispersion wherein water is the continous phase, then polymerizing said dispersion at a temperature in the range of about 30° C. to about 80° C. to convert the remaining monomer(s) to polymer, the improvement which comprises (1) applying a prime coating to the internal surfaces of said reaction vessel, said prime coating comprising a tannin selected from the group consisting of hydrolyzable tannins, condensed tannins, ammonium tannates and tannins complexed with metal ions, (2) applying to said prime coating a top coating of a water-soluble suspending agent, (3) polymerizing the continuous monomer(s) phase in contact with said top coating, and (4) polymerizing said continuous water phase in contact with said prime coating after dissolving siad top coating in the continuous water phase, whereby polymer buildup on said internal surfaces is substantially eliminated.

4,182,810

PREVENTION OF FOULING IN POLYMERIZATION REACTORS

Kenneth W. Willcox, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 21, 1978, Ser. No. 898,553
Int. Cl.[2] C08F 2/14, 4/78, 10/00, 10/02
U.S. Cl. 526—64 10 Claims



1. In a process in which at least one olefin is polymerized in a hydrocarbon diluent in a turbulent reaction zone to produce particles of polymer which are substantially insoluble in the diluent, the method of reducing adherence of polymer particles to the walls of the reaction zone which comprises adding to the reaction medium in an amount effective to reduce adherence of polymer particles to the walls a composition comprising

(a) a polysulfone copolymer of sulfur dioxide and an olefinic compound;

(b) a polymeric polyamine which is a reaction product of epichlorohydrin with an aliphatic primary monoamine or N-aliphatic hydrocarbyl alkylene diamine; and

(c) an oil-soluble sulfonic acid.

4,182,811

POLYMERIC GEL CATALYST FOR POLYMERIZATION OF α-OLEFINES, CONJUGATED AND NON-CONJUGATED DIENES

Jury N. Bocharov, ulitsa Dokukina, 3, korpus 1, kv. 13; Viktor A. Kabanov, Lomonosovsky prospekt, 3, korpus 1, kv. 3; Marina A. Martynova, ulitsa Stasovoi, 4, kv. 34, all of Moscow; Valery G. Popov, ulitsa 1, 17/1, kv. 3, Moskovskaya oblast, poselok Chernogolovka; Vladimir I. Smetanjuk, ulitsa Stasovoi, 4, kv. 34, and Viktor V. Fedorov, 3 Samotechny pereulok, 23, kv. 88, both of Moscow, all of U.S.S.R.

Division of Ser. No. 737,108, Oct. 29, 1976, which is a continuation of Ser. No. 490,992, Jul. 23, 1974, abandoned. This application Feb. 27, 1978, Ser. No. 881,818
Claims priority, application U.S.S.R., Jul. 24, 1973, 1950384
Int. Cl.[2] C08F 4/02, 110/00, 110/02, 136/06
U.S. Cl. 526—69 9 Claims

1. A process for the polymerization of α-olefines, and conjugated and non-conjugated dienes comprising reacting the same in the presence of a catalyst comprising a catalyst containing from 0.1 to 50 wt.% of a compound of a transition metal from Groups IV–VIII of the periodic system chemically combined and distributed over the surface of a rubbery polymeric carrier containing from 1 to 50 wt.% of a moiety selected from the Group consisting of electron-donor, electron-acceptor groups, and mixtures thereof; a co-catalyst of an organometallic compound of a metal from Groups I–III of the periodic system with the molar ratio of the co-catalyst to the compound of the transition metal from Groups IV–VIII ranging from 1 to 500, said catalyst being in the form of a gel swellable but insoluble in the reaction medium, in a solvent selected from the group consisting of a liquid hydrocarbon and a halogenated hydrocarbon at a temperature of no more than 200° C. under a pres-

sure of from 0 to 100 atm; and separating the reaction products from the catalyst.

4,182,812

PROCESS FOR THE PREPARATION OF HYDANTOIN LACQUERS

Wilfried Zecher, and Rudolf Merten, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

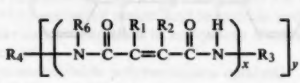
Filed Nov. 23, 1977, Ser. No. 854,111

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714655

Int. Cl.² C08G *18/67, 18/82;* C07D *233/76*

U.S. Cl. 528—73 **8 Claims**

1. A process for the preparation of polyhydantoins comprising reacting at a temperature of from 0° to 450° C. an at least bifunctional organic isocyanate or isothiocyanate with an unsaturated diamide of the formula:



wherein

R_1, R_2, R_3, R_4 and R_6 may be the same or different and each is from the group consisting of hydrogen, alkyl of 1–20 carbon atoms, alkenyl of 1–20 carbon atoms, aryl of 4–20 carbon atoms and aralkyl of 7–20 carbon atoms, and R_4 and R_6 together are additionally a heterocyclic ring having 3–7 carbon atoms wherein the nitrogen heteroatom is bonded to both R_3 and R_6, and

R_1 and R_2 are also additionally halogen, and

x and y each are integers from 1 to 3, with the proviso that at least one of x and y is 1.

4,182,813

PROCESS FOR THE PREPARATION OF 1,2-POLYBUTADIENE

Kenya Makino, Kuwana; Koei Komatsu, Yokkaichi; Yasumasa Takeuchi, and Masayuki Endo, both of Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

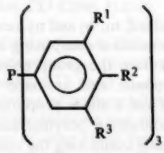
Filed May 15, 1978, Ser. No. 905,951

Claims priority, application Japan, May 23, 1977, 52-58725

Int. Cl.² C08F *4/80*

U.S. Cl. 526—92 **20 Claims**

1. A process for producing crystalline 1,2-polybutadiene by contacting 1,3-butadiene with a catalyst composed of (A) a cobalt compound, (B) an organoaluminum compound, (C) water in an amount of 0.25 to 1.5 mols per mol of said organoaluminum compound, and (D) an organic phosphorus compound in a halogenated hydrocarbon solvent to polymerize the butadiene, characterized in that as said organic phosphorus compound there is used a compound represented by the general formula:



wherein R^1 is an alkyl or aryl group, and R^2 and R^3 represent independently hydrogen or alkyl or aryl groups.

4,182,814

PROCESS FOR THE PRODUCTION OF POLYBUTADIENE HAVING A HIGH CIS-1,4-CONTENT

Paul Bernemann, Haltern; Rudolf Kentschke, and Dieter Wieland, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels, A.G., Marl, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,240

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731067

Int. Cl.² C08F *136/06, 4/80*

U.S. Cl. 526—92 **5 Claims**

1. In a process for the production of polybutadiene having a high cis-1,4-content by the polymerization of 1,3-butadiene in a hydrocarbon solvent in the presence of 1,2-butadiene and a catalyst consisting essentially of

(a) an organoaluminum compound,

(b) water, and

(c) a cobalt compound soluble in the solvent,

the improvement wherein the 1,3-butadiene is polymerized at a temperature of 0°–100° C., the solvent is hexane; the catalyst consists essentially of

(a) diethylaluminum chloride,

(b) water, and

(c) cobalt octoate, cobalt naphthenate or a mixture thereof; and the catalyst components are added to a mixture of the 1,3-butadiene 1,2-butadiene and the hydrocarbon solvent in the sequence of (a), then (b), and then (c), wherein the mixture is homogenized after addition of each catalyst component; and wherein the amount of component (a) employed is 0.05–1 wt.% based on the amount of 1,3-butadiene used; the amount of component (b) employed is 0.1–0.8 mole per mole of component (a); and the amount of component (c) employed is 0.0005–0.01 wt.% (calculated as Co), based on the amount of 1,3-butadiene used.

4,182,815

REDUCTION AND REOXIDATION OF COGEL OR SELF-REDUCED CATALYST

Max P. McDaniel, and Melvin B. Welch, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 857,553, Dec. 5, 1977, Pat. No. 4,151,122. This application Feb. 6, 1979, Ser. No. 9,618

Int. Cl.² C08F *4/24*

U.S. Cl. 526—96 **23 Claims**

1. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms with a chromium-containing catalyst prepared by coprecipitating a titanium compound and a silicate to form a cogel comprising a first step wherein said catalyst is contacted with a nonoxidizing ambient at a temperature of at least 600° C. and a subsequent second step where it is contacted with an oxygen-containing oxidizing ambient at a temperature within the range of 450°–1000° C., and recovering a polymer.

17. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule with a titanium-free silica catalyst composition containing chromium wherein said catalyst composition is formed by subjecting a titanium-free silica composition containing chromium wherein at least a portion of said chromium is in the form of CrO_3 to an inert ambient for a time and at a temperature sufficient to self-reduce at least a portion of said CrO_3 to a lower valence state, and thereafter subjecting the thus self-reduced composition to a reducing ambient at a temperature sufficient to further reduce at least a portion of said chromium, and thereafter oxidizing the thus reduced composition, and recovering a polymer.

4,182,816
OLEFINE POLYMERIZATION PROCESS

Anthony D. Caunt, Welwyn Garden City; Michael S. Fortuin, Tarporley, and Ian G. Williams, Letchworth, all of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 627,451, Oct. 30, 1975, Pat. No. 4,108,796. This application Jun. 14, 1978, Ser. No. 915,573

Claims priority, application United Kingdom, Oct. 30, 1974, 46966/74

Int. Cl.[2] C08F *4/76*

U.S. Cl. 526—119 **12 Claims**

1. A process for the production of a polymer of a mono-alpha-olefine which comprises contacting at least one mono-alpha-olefine with an olefine polymerization catalyst comprising

(I) the product obtained by grinding a titanium trihalide in the presence of from 5 up to 75% molar, relative to the titanium trihalide, of an organic Lewis Base compound and from 1 up to 50% molar, relative to the titanium trihalide, of a titanium tetrachloride, wherein the amount of the organic Lewis Base is such as to provide at least one functional group for each molecule of the titanium tetrachloride and the organic Lewis Base compound contains at least one phosphorus atom and is selected from the group consisting of hexamethylphosphoric triamide; N,N,N′,N′-tetramethylethyl phosphorodiamidate; N,N,N′,N″-pentamethyl-N″-betadimethylamino-ethyl-phosphoric triamide; 2-dimethylamino-1,3-dimethyl-1,3,2-diazaphospholidine-2-oxide; octamethylpyrophosphoramide; hydrocarbyl phosphines; hydrocarbyl phosphine oxides; hydrocarbyl phosphites and hydrocarbyl phosphates; and

(II) at least one organo-metallic compound of aluminium or of a non-transition metal of Group IIA of the Periodic System, or a complex of an organo-metal compound of a non-transition metal of Group IA or IIA of the Periodic System and an organo-aluminium compound.

4,182,817
STEREOSPECIFIC OLEFIN POLYMERIZATION PROCESSES

Thomas J. Lynch, Houston, and Robert J. Rowatt, Orange, both of Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 835,270, Sep. 21, 1977, abandoned. This application May 19, 1978, Ser. No. 907,446

Int. Cl.[2] C08F *4/02, 10/02*

U.S. Cl. 526—169 **9 Claims**

1. In a continuous process for the polymerization of a polymerizable olefin in a liquid hydrocarbon medium in which olefin monomer is continuously added to the polymerization zone, finely-divided solid polymerization catalyst is added to the polymerization zone, and the polymerization product is continuously withdrawn from the reaction zone; the improvement which consists essentially of feeding the polymerization catalyst to the reaction zone on a continuous basis by pumping a Bingham fluid composition into the reaction zone, said Bingham fluid composition being a solid at ambient temperature and consisting essentially of a finely-divided solid polymerization catalyst uniformly dispersed in a continuous solid phase which consists essentially of an intimate mixture of a wax and a liquid hydrocarbon.

4,182,818
POLYFUNCTIONAL LITHIUM CONTAINING INITIATOR

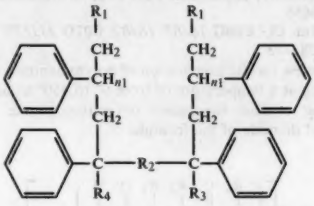
Lu H. Tung, and Grace Y-S. Lo, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 15, 1977, Ser. No. 824,883

Int. Cl.[2] C08F *4/48*

U.S. Cl. 526—173 **9 Claims**

1. A method for the polymerization of vinyl compounds containing at least one vinyl group and particularly vinyl hydrocarbon compounds which are polymerizable in the presence of a lithium containing catalyst, the steps of the method comprising providing a solution of at least one polyfunctional lithium containing polymerization initiating compound containing at least two active lithium atoms, the compound having the formula:

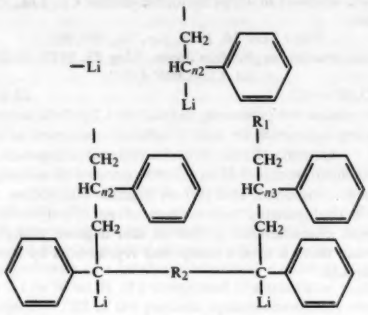


wherein

R_1 is selected from the group consisting of alkyl, cycloalkyl, and aromatic radicals containing from 1 to 20 carbon atoms;

R_2 is a divalent organic radical having at least 6 carbon atoms, R_2 having at least one aromatic ring and the aromatic ring or rings being directly attached to the carbon atoms which are attached to R_3 and R_4 respectively, with the further limitation R_2 contains carbon and hydrocarbon, and optionally oxygen, and/or sulfur, oxygen and sulfur when present are present only in a configuration of a diphenyl oxide or diphenyl sulfide;

and R_3 and R_4 are individually selected from the group consisting of



and mixtures thereof, n_1, n_2 and n_3 have average values of 1 or greater, the solution comprising a major portion of a solvent selected from the group consisting of liquid aliphatic, cycloaliphatic and aromatic hydrocarbons and mixtures thereof and a minor proportion of the polyfunctional lithium containing polymerization initiating compound subsequently contacting the resultant solution with at least one lithium polymerizable monomer to cause the polymerization of the monomer to a corresponding polymer.

4,182,819

PROCESS FOR THE MANUFACTURE OF VINYL CHLORIDE COPOLYMERS OF A SMALL AND REGULAR PARTICLE SIZE

Johann Bauer, Burghausen; Hans Birke, Marktl; Kurt Fendel, Schildgen, and Harald Sulek, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker- Chemie GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 651,972, Jan. 23, 1976, abandoned. This application Dec. 12, 1977, Ser. No. 859,335
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1975, 2503154
Int. Cl.[2] C08F *2/20, 218/08*
U.S. Cl. 526—202 17 Claims

1. A process for the manufacture of a vinyl chloride copolymer soluble in lacquer solvents with a clear solution consisting of copolymerizing a monomer mixture of from 50% to 95% by weight of vinyl chloride and from 5% to 50% by weight of at least one olefinically-unsaturated compound copolymerizable with vinyl chloride selected from the group consisting of vinyl acetate and mixtures of vinyl acetate with from 5% to 15% by weight of vinyl acetate of maleic acid anhydride under suspension polymerization conditions in an aqueous dispersion and in the presence of

(a) a monomer-soluble polymerization catalyst,

(b) from 0.1% to 0.3% by weight, based on the weight of monomers, of a water-soluble salt of a maleic acid anhydride polymerizate of from 45 to 55 mol percent of

(1) maleic acid anhydride,

(2) from 5 to 15 mol percent of an unsaturated compound having the formula

$$CH_2{=}CH{-}O{-}\underset{\underset{O}{\|}}{C}{-}C_nH_{2n+1}$$

and n represents an integer of from 4 to 28, and

(3) the remainder to 100 mol percent of a vinyl compound having the formula

$$CH_2{=}CH{-}O{-}\underset{\underset{O}{\|}}{C}{-}C_mH_{2m+1}$$

wherein m is an integer from 1 to 3,

(c) from 0.003% to 0.007% by weight, based on the weight of the monomers, of a polyvinyl alcohol having a viscosity of from 3 to 10 cP, determined in a 4% aqueous solution at 20° C., and a saponification number of 240 to 320, and

(d) from 0.03% to 0.05% by weight, based on the weight of the monomers of sodium chloride,

and recovering said vinyl chloride copolymer having the majority of its particles of a size between 0.1 and 0.5 mm.

4,182,820

PROCESS FOR POLYMERIZATION OF STYRENE AND ACRYLONITRILE

Don C. Curfman, Washington, and Gary D. Rea, Parkersburg, both of W. Va., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 8, 1978, Ser. No. 913,614
Int. Cl.[2] C08F *212/10*
U.S. Cl. 526—212 2 Claims

1. A method for the production of copolymers of styrene and acrylonitrile which comprises preparing a first mixture of from about 0.39 to about 0.72 parts of an emulsifier selected from the group consisting of sodium alkylbenzene sulfonate, potassium oleate, sodium dresinate and the potassium salt of a hydrogenated mixture of long chain fatty acids, from about 0.28 to about 0.61 parts of a dispersing agent comprising a long chain fatty alcohol, and from about 100 to about 180 parts of water, preparing a second mixture of from about 30 to about 70 parts of styrene monomer and correspondingly from about 70 to 30 parts of acrylonitrile monomer, adding said second mixture to said first mixture, and heating said resultant mixture for a period of about 100 minutes at a temperature of 70° C.

4,182,821

METHOD FOR PRODUCING A LEAD CONTAINING MONOMER COMPOSITION AND A RADIATION SHIELDING POLYMER

Haruo Nagai; Hiroshi Uehara, both of Nakajo, and Kunikazu Nunokawa, Kurokawa, all of Japan, assignors to Kyowa Gas Chemical Industry Co., Ltd., Japan

Filed Nov. 14, 1977, Ser. No. 850,965
Claims priority, application Japan, Nov. 19, 1976, 51-139130
Int. Cl.[2] C07F *7/24*
U.S. Cl. 526—240 28 Claims

1. A method for producing a lead containing monomer composition comprising reacting a mixture comprising (1) at least one monomer selected from the group consisting of alkyl methacrylate having 1–4 carbon atoms in an alkyl group, hydroxyalkyl acrylate, hydroxyalkyl methacrylate and styrene, (2) at least one monomer selected from the group consisting of acrylic acid and methacrylic acid, (3) at least one organic acid having the general formula: R_1COOH, wherein R_1 is a saturated or unsaturated hydrocarbon residue which is nonsubstituted or substituted with a hydroxyl group and having 5–20 carbon atoms and (4) an organic acid having the general formula: R_2COOH excluding acrylic and methacrylic acids, wherein R_2 is a saturated or unsaturated hydrocarbon residue having 2–4 carbon atoms with lead monoxide, wherein

(i) an amount of lead monoxide to total weight of a raw material to be used is 6.5–57% by weight,

(ii) a ratio of total moles of the organic acids to gram atoms of lead is at most 4,

(iii) an amount of said monomer (2) to the raw material is 3–45% by weight, a total amount of said organic acid (3) and said organic acid (4) to the raw material is 1.1–60% by weight and moles (A) of said monomer (2) and moles (B) of said organic acid (3) and said organic acid (4) to 100g of the raw material satisfy anyone of the following formulas I and II:

$$B > 0.3A - 0.04 \quad \text{(I)}$$

$$B > -0.7A + 0.36 \quad \text{(II)}$$

and

(iv) an amount of said organic acid (4) to the total amount of both organic acid (3) and organic acid (4) is 0–50% by weight.

15. A method for producing a radiation shielding polymer comprising polymerizing lead containing monomer composition produced by a method comprising reacting a mixture comprising (1) at least one monomer selected from the group consisting of alkyl methacrylate having 1–4 carbon atoms in an alkyl group, hydroxyalkyl acrylate, hydroxyalkyl methacrylate and styrene, (2) at least one monomer selected from the group consisting of acrylic acid and methacrylic acid, (3) at least one organic acid having the general formula: R_1COOH, wherein R_1 is a saturated or unsaturated hydrocarbon residue which is non-substituted or substituted with a hydroxyl group and having 5–20 carbon atoms and (4) an organic acid having the general formula: R_2COOH excluding acrylic and methacrylic acids, wherein R_2 is a saturated or unsaturated hydrocarbon residue having 2–4 carbon atoms with lead monoxide, wherein

(i) an amount of lead monoxide to total weight of a raw material to be used is 6.5–57% by weight,

(ii) a ratio of total moles of the organic acids to gram atoms of lead is at most 4,

(iii) an amount of said monomer (2) to the raw material is 3–45% by weight, a total amount of said organic acid (3) and said organic acid (4) to the raw material is 1.1–60% by weight and moles (A) of said monomer (2) and moles (B)

of said organic acid (3) and said organic acid (4) to 100 g of the raw material satisfy anyone of the following formulas I and II:

$$B > 0.3A - 0.04 \quad (I)$$

$$B > -0.7A + 0.36 \quad (II)$$

and

(iv) an amount of said organic acid (4) to the total amount of both organic acid (3) and organic acid (4) is 0–50% by weight.

4,182,822

HYDROPHILIC, SOFT AND OXYGEN PERMEABLE COPOLYMER COMPOSITION

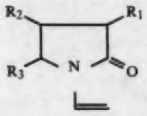
Sing-Hsiung Chang, 6 Buckskin Height Dr., Danbury, Conn. 06810

Filed Nov. 8, 1976, Ser. No. 740,128
Int. Cl.² C08F 26/10, 30/08
U.S. Cl. 526—264 **14 Claims**

1. A composition of matter having the characteristics of increased hydrophilicity, softness after hydration and oxygen permeability, said composition being a copolymer of comonomers consisting essentially of:

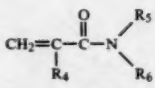
(a) about 15 to 65 parts by weight of at least one of the amide group containing monomers consisting of:

(1) N-vinyl pyrrolidone having the structure



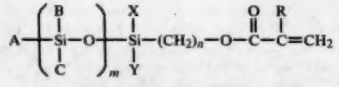
wherein R_1, R_2 and R_3, which may be the same or different.

are selected from a class consisting of hydrogen and C_1–C_4 alkyl groups; and (2) acrylamide and methacrylamide having the structure

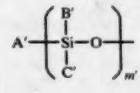


wherein R_4 is selected from a class consisting of a methyl group and hydrogen; R_5 and R_6, which may be the same or different, are selected from a class consisting of hydrogen and C_1–C_4 alkyl groups, wherein the selection both of R_5 and R_6 from hydrogen is excluded; and

(b) about 10 to 85 parts by weight of at least one of a polysiloxanylalkyl ester having the structure:



wherein X and Y, which may be the same or different, are selected from a class consisting of C_1–C_4 alkyl groups, phenyl groups and a Z group having the structure:



wherein A, B, C, A', B' and C', which may be the same or different, are selected from a class consisting of C_1–C_4 alkyl groups and phenyl groups; R is selected from a class consisting of a methyl group and hydrogen; m and m', which may be the same or different, are integers from one to four, and n is an integer from one to three.

4,182,823

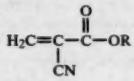
ANIONIC POLYMERIZATION INHIBITOR FOR CYANOACRYLATE ADHESIVES

Jules E. Schoenberg, Scotch Plains, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Aug. 18, 1978, Ser. No. 934,856
Int. Cl.² C08F 2/40, 120/50
U.S. Cl. 526—298 **15 Claims**

1. An adhesive composition comprising a mixture of:

A. at least 65% by weight of a monomeric ester of 2-cyanoacrylic acid of the general formula:



wherein R is an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, a cyclohexyl group, or a phenyl group; and

B. a stabilizing amount of a protonic acid chelate containing a boron atom bonded to at least three oxygen atoms formed from reaction of boric acid, or a compound which forms boric acid or tetravalent monoborate ions in the monomeric ester, with a polyhydroxy compound capable of forming said chelate and containing no reactive groups which can initiate anionic polymerization.

4,182,824

CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Toshio Suzuki, and Akito Nakamura, both of Ichihara, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

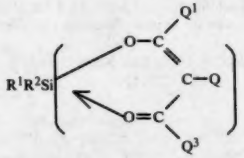
Filed Nov. 16, 1978, Ser. No. 961,428
Claims priority, application Japan, Dec. 29, 1977, 52-159100
Int. Cl.² C08G 77/06
U.S. Cl. 528—15 **2 Claims**

1. A curable composition of matter which consists of

(a) an organopolysiloxane having at least two lower alkenyl groups bonded to silicon atoms;

(b) a hydrogen-containing organopolysiloxane having at least two hydrogen atoms bonded to silicon atoms wherein there is provided from 0.5 to 2.0 silicon-bonded hydrogen atoms per alkenyl group in component (a);

(c) a silane having the general formula



2

wherein R^1, R^2, Q^1, Q^2 and Q^3 are selected independently from the group consisting of hydrogen atoms, lower molecular weight alkyl radicals, alkenyl radicals, aryl radicals, alkoxy radicals and the partial hydrolysis products from the alkoxy radicals and,

(d) a hydrosilylation catalyst.

4,182,825

POLYETHER BASED URETHANES WITH SUPERIOR DYNAMIC PROPERTIES

William A. Jackle, Newtown, Pa., assignor to Thiokol Corporation, Newtown, Pa.

Filed Oct. 11, 1978, Ser. No. 950,336
Int. Cl.[2] C08G *18/10*
U.S. Cl. 528—44 8 Claims

1. A curable composition comprising:
(a) a polyether polyol endcapped with toluene diisocyanate and having a free toluene diisocyanate content of less than 0.45%; and
(b) 4,4'-methylene-bis-(2-chloroaniline).

4,182,826

PROCESS FOR THE PRODUCTION OF RAPID-SET MOLDINGS

Heimo Lüdke, Schildgen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 709,840, Jul. 29, 1976, abandoned. This application Mar. 8, 1978, Ser. No. 884,449
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1975, 2534247
Int. Cl.[2] C08G *18/22, 18/08*
U.S. Cl. 528—57 5 Claims

1. A process for the production of solid non-foamed moldings, consisting essentially of: (A) polymerizing an organic polyisocyanate in a closed metal mold in the presence of compounds which bring about the trimerization of isocyanate groups and in the presence of compounds containing isocyanate-reactive groups and in the absence of blowing agent in order to avoid the production of foamed moldings and wherein the temperature of the surfaces of said metal mold are maintained at from about 50 to about 70° C. and wherein the equivalent ratio between isocyanate groups and isocyanate-reactive groups is from about 1:0.2 to 1:0.03 and (B) removing the molding from said mold 0.25 to 2.5 minutes after filling of said mold with said reactants.

4,182,827

POLYURETHANE HYDROGELS HAVING ENHANCED WETTING RATES

Allen P. Jones, Charleston, and Robert J. Knopf, Saint Albans, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,702
Int. Cl.[2] C08G *18/10*
U.S. Cl. 528—60 12 Claims

1. A method of improving the wetting rate of a water swellable, lightly crosslinked hydrogel polymer which comprises contacting said polymer with a surface treating composition comprising a mixture of:
(A) a surface treating compound selected from the group consisting of:
(a) a liquid ketone of the formula RCOR' wherein R is an alkyl group of from 1 to 6 carbon atoms and R' is an alkyl group of 1 to 6 carbon atoms or phenyl,
(b) a liquid alkanol having from 1 to 6 carbon atoms,
(c) an aliphatic, cycloaliphatic or aromatic amine having up to 12 carbon atoms,
(d) an aromatic hydrocarbon having from 6 to 10 carbon atoms,
(e) a cyclic oxide having from 2 to 4 ring carbon atoms,
(f) an aqueous solution of an alkali metal hydroxide; and
(B) from 0 to 5 percent by weight, based on the weight of (A), of a surfactant;
wherein said hydrogel polymer is the polymer of the isocyanato terminated prepolymer comprising the reaction product of:
(i) a poly (alkyleneoxy) polyol having an average molecular weight up to about 25,000 wherein the alkyleneoxy group contains from 2 to 4 carbon atoms, and
(ii) an organic diisocyanate, said prepolymer lightly crosslinked with an equivalent amount of a crosslinking agent of the group:
(iii) water or organic polyamine; wherein said poly (alkyleneoxy) polyol is a mixture of a major amount of a poly (ethyleneoxy) diol having a average molecular weight of from about 4,000 to about 25,000, and a monor amount of a higher polyol of the group poly (alkyleneoxy) triol or poly (alkyleneoxy) tetrol or aliphatic polyhydroxy compound of the formula $C_nH_{2n+2-m}(OH)_m$ wherein n has a value of 3 to 6 and m has a value of 3 to 4, or mixtures thereof, said triol or tetrol having an average molecular weight of from about 92 to 5,000, wherein the mole ratio of diol to higher polyol in said mixture is from about 6:1 to 40:1; wherein the equivalents ratio of isocyanato groups to hydroxyl groups is from about 1.2:1 to about 1.6:1; wherein the organic polyamine is a primary or secondary diamine or triamine; and wherein the equivalents of reactive crosslinking groups in said crosslinking agent used is equivalent to the number of equivalents of isocyanato groups present in said prepolymer.

4,182,828

PRODUCTION OF SOLUTIONS OR DISPERSIONS OF POLYISOCYANATE POLYADDITION PRODUCTS CONTAINING URETHANE AND/OR UREA GROUPS AND CONTAINING BOTH ANIONIC AND CATIONIC GROUPS

Artur Reischl, Leverkusen, and Wolfgang Wenzel, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 27, 1978, Ser. No. 900,690
Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721985
Int. Cl.[2] C08G *18/38*
U.S. Cl. 528—69 14 Claims

1. A process for the production of solutions or dispersions of non-foamed urethane and/or urea group-containing polyisocyanate polyaddition products in which chemically fixed anionic groups and chemically fixed cationic groups are simultaneously present in a medium selected from the group consisting of water, organic solvents and dispersants which comprises reacting:
(a) isocyanates selected from the group consisting of organic polyisocyanates and organic monoisocyanates; with
(b) organic compounds selected from the group consisting of organic compounds containing at least two isocyanate-reactive groups and organic compounds containing one isocyanate-reactive group, compounds containing ionic groups and/or groups which may be converted into ionic groups being used as component (a) and/or component (b), characterized in that the compounds containing ionic groups or groups convertible into ionic groups which are used in accordance with the present invention are both:
(i) compounds containing anionic groups and/or groups convertible into anionic groups; and
(ii) compounds containing cationic groups and/or groups convertible into cationic groups; any groups convertible into ionic groups which are present in the polyaddition product on completion of its synthesis being at least partly converted into ionic groups, in known manner by neutralization or quaternization, and the synthesis components used and the degree of neutralization and quaternization being selected in such a way that an equivalent ratio between cationic and anionic groups of from about 5:1 to 1:10 prevails in the end product ultimately obtained for a total content of ionic groups of from about 2 to 300 milliequivalents per 100 g of solids and in that at least one urethane or urea group is present between every cationic and anionic group which is chemically fixed in the end product, and

(c) dissolving or dispersing the polyisocyanate polyaddition products during or after their production in said medium.

4,182,829

IMPRESSION MATERIALS FOR DENTISTRY

Michael Walkowiak, Cologne; Hans-Hermann Schulz, Leichlingen, and Hans J. Rosenkranz, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 904,071

Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724260

Int. Cl.[2] C08G *18/34, 18/67, 18/62*

U.S. Cl. 528—75 **11 Claims**

1. An impression material for use in dentistry comprising (I) the reaction product of (a) a diisocyanate or triisocyanate, (b) a dihydroxy compound selected from the group consisting of polyesters, polyethers, polythioethers, polyacetals, polycarbonates and polyester-amides having a molecular weight of from 300 to 10,000 and (c) a derivative of acrylic and/or methacrylic acid having a hydroxyl group wherein the molar ratio of compounds (a), (b) and (c) is 2:1:2, and (II) an inert dental carrier, said impression material having a hardening time of about 4–5 minutes.

4,182,830

VINYL ESTER URETHANES

Ernest C. Ford, Jr., Newark, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Jul. 24, 1978, Ser. No. 927,461

Int. Cl.[2] C08G *18/32*

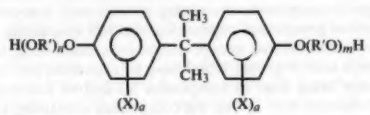
U.S. Cl. 528—75 **27 Claims**

1. A vinyl ester urethane resin having the following formula:

$$-\left[B—I—A—M\right]_y A—(I—B)_q$$

wherein

A is a radical derived from a polyoxyalkylene bisphenol, A having the following formula:



wherein

R′ is C_1–C_4 alkylene group,

X is halogen or a C_1–C_4 alkyl group,

a is an integer equal to from 0 to 2, and

m and n are integers each of which is equal to at least 1 and the sum of which is equal from about 2.0 to about 8.0;

M is a radical derived from (A) an unsaturated aliphatic polycarboxylic acid or an anhydride thereof, (B) a saturated aliphatic polycarboxylic acid or an anhydride thereof; (C) an aromatic polycarboxylic acid or anhydride thereof, or (D) mixtures of A, B, or C;

I is a radical derived from an isocyanate; having an average isocyanate functionality greater than two,

B is a radical derived from a monohydroxyl-terminated ester of acrylic acid or a methacrylic acid,

y is an integer equal to from 1 to about 12.

q is an integer of one or zero.

4,182,831

CATIONIC EPOXIDE RESINOUS COMPOSITION

Darrel D. Hicks, Jeffersontown, Ky., assignor to Celanese Polymer Specialties Company, Louisville, Ky.

Continuation-in-part of Ser. No. 858,135, Dec. 7, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,375

Int. Cl.[2] C08G *59/50*

U.S. Cl. 528—103 **11 Claims**

1. A soluble and fusible resinous composition comprising the reaction product of

(A) a polyepoxide resin derived from a dihydric phenol or a dihydric alcohol and an epihalohydrin, said polyepoxide resin having a 1,2-epoxide equivalent weight of about 180 to about 650;

(B) an amine mixture of

(1) an aliphatic monoamine containing about 8 to about 18 carbon atoms, one primary amine group and no other groups reactive with epoxy groups, and

(2) an aliphatic diamine containing one primary amine group and one tertiary amine group and no other groups reactive with epoxide groups wherein the molar ratio of (1) and (2) in the mixture varies from about 2:1 to about 1:3, and

(C) a monoepoxide which contains one 1,2-epoxide group and no other groups reactive with amine groups, said monoepoxide having about 8 to 24 carbon atoms

wherein A, B and C are reacted in the mol ratio of 5:6:2 to 2:3:2, and wherein A and C are added to B at a reaction temperature of about 50° C. to about 150° C. at an addition rate which does not substantially exceed the epoxy-amine reaction rate.

4,182,832

CURABLE COMPOSITION CONTAINING 1,4-DIAMINOBUTANE DERIVATIVES

Helmut Zondler, Bottmingen; Roland Moser, and Thaddeus Audykowski, both of Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

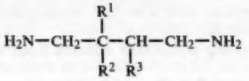
Division of Ser. No. 856,952, Dec. 2, 1977, abandoned. This application Oct. 11, 1978, Ser. No. 950,339

Claims priority, application Switzerland, Dec. 10, 1976, 15572/76

Int. Cl.[2] C08G *59/50*

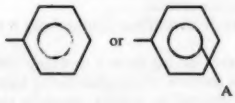
U.S. Cl. 528—103 **5 Claims**

1. A curable mixture comprising (a) a 1,4-diaminobutane, of the formula I



(I)

in which R^1 is H or $—CH_3$ and R^2 and R^3 independently of one another are each denote a radical of the formula



in which A is alkyl having 1 to 3 C atoms, $—OCH_3$, $—N(CH_3)_2$, —Cl or —Br, and R^2 is also alkyl having 1 to 3 C atoms, and (b) a polyepoxide compound (X) having, on average, more than one epoxide group in the molecule, there being, in the mixture, 0.5 to 1.5 equivalents of active hydrogen atoms, bonded to nitrogen, in the particular 1,4-diaminobutane per 1 equivalent of epoxide groups in the epoxide compound (X).

4,182,833

CATIONIC EPOXIDE-AMINE REACTION PRODUCTS

Darrell D. Hicks, Jeffersontown, Ky., assignor to Celanese Polymer Specialties Company, Louisville, Ky.

Continuation-in-part of Ser. No. 858,134, Dec. 7, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,376

Int. Cl.[2] C08G 59/50

U.S. Cl. 528—120 8 Claims

1. A soluble and fusible resinous composition comprising the reaction product of

(A) a polyepoxide resin derived from a dihydric phenol or a dihydric alcohol and an epihalohydrin, said polyepoxide resin having a 1,2-epoxide equivalent weight of about 150 to about 300; and

(B) an amine mixture of

(1) an aliphatic monoamine containing about 8 to about 18 carbon atoms, one primary amine group and no other groups reactive with epoxy groups, and

(2) an aliphatic diamine containing one primary amine group and one tertiary amine group and no other groups reactive with epoxide groups

wherein the molar ratio of (1) and (2) in the mixture varies from about 2:1 to about 1:3,

wherein A and B are reacted in the mol ratio of 10:9 to 9:10 and wherein A is added to B at a reaction temperature of about 50° C. to about 150° C. at an addition rate which does not substantially exceed the epoxy-amine reaction rate.

4,182,834

POLYPHOSPHAZENE COPOLYMERS CONTAINING SUBSTITUENTS FROM TETRAALKYL TITANATE

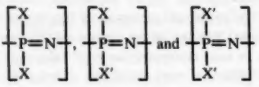
William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1978, Ser. No. 941,106

Int. Cl.[2] C08G 79/04, 79/00

U.S. Cl. 528—168 10 Claims

1. A polyphosphazene copolymer containing randomly distributed units represented by the formulas:



wherein X is —OTi(OR)$_3$ in which R is selected from the group consisting of branched, straight chain and cyclic alkyl groups containing from 1 to 12 carbon atoms and where X′ is selected from the group consisting of substituted and unsubstituted alkoxy, aryloxy, amino and mercapto groups.

4,182,835

POLYPHOSPHAZENE COPOLYMERS CONTAINING NITROALKYL SUBSTITUENTS

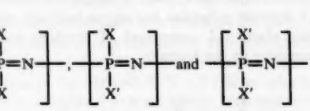
William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1978, Ser. No. 941,109

Int. Cl.[2] C08G 79/02, 85/00

U.S. Cl. 528—168 10 Claims

1. A polyphosphazene copolymer containing randomly distributed units represented by the formulas:



wherein X is —CNO$_2$R$_1$R$_2$ in which R$_1$ and R$_2$ are selected from the group consisting of H, a branched, straight chain and cyclic alkyl group containing from 1 to 12 carbon atoms or mixtures thereof, and where X′ is selected from the group consisting of substituted and unsubstituted alkoxy, alkenyloxy, aryloxy alkenylaryloxy, amino and mercapto groups or mixtures thereof.

4,182,836

POLYPHOSPHAZENE COPOLYMERS CONTAINING SUBSTITUENTS FROM ALKYLPHOSPHITE

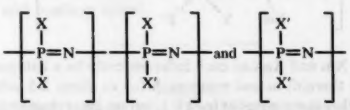
William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1978, Ser. No. 941,111

Int. Cl.[2] C08G 79/02, 85/00

U.S. Cl. 528—168 10 Claims

1. A polyphosphazene copolymer containing randomly distributed units represented by the formulas:



wherein X is —OP(OR)$_2$ in which R is selected from the group consisting of branched, straight chain and cyclic alkyl groups containing from 1 to 12 carbon atoms and where X′ is selected from the group consisting of substituted and unsubstituted alkoxy, aryloxy, amino and mercapto groups.

4,182,837

POLYPHOSPHAZENE COPOLYMERS CONTAINING SULFONE SUBSTITUENTS

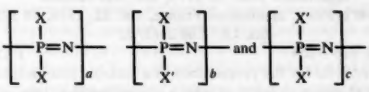
William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 20, 1978, Ser. No. 953,281

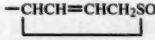
Int. Cl.[2] C08L 81/06, 79/00

U.S. Cl. 528—168 12 Claims

1. A polyphosphazene copolymer containing units represented by the formulas:



wherein X is a sulfone radical selected from the group consisting of —CR$_1$R$_2$—SO$_2$—R and



in which R is alkyl containing from 1 to 12 carbon atoms, cycloalkyl containing from 3 to 12 carbon atoms or aryl and R$_1$ and R$_2$ are individually selected from the group consisting of hydrogen, alkyl radicals containing from 1 to 11 carbon atoms, cycloalkyl radicals containing from 3 to 11 carbon atoms and aryl radicals; wherein X′ is an organic radical selected from the group consisting of substituted or unsubstituted alkoxy, aryloxy, amino and mercapto groups and wherein $20 \leqq (a+b+c) \leqq 50{,}000$ per polymer.

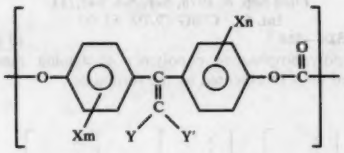
4,182,838

POLYCARBONATE COMPOSITIONS HAVING IMPROVED FLAME RETARDANCE AND IMPROVED WATER VAPOR TRANSMISSION

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Feb. 28, 1978, Ser. No. 882,126
Int. Cl.[2] C08G *63/62*
U.S. Cl. 528—202 6 Claims

1. A high molecular weight aromatic polycarbonate having improved flame retardance and improved water vapor transmission, said polycarbonate having an I.V. of about 0.40–1.0 dl/g. and being represented by the general formula



wherein Xm and Xn can each independently be a halogen and mixtures thereof; m and n are each 0.0 to about 2.5 with the proviso that m+n equal at least 0.1, but no more than about 2.5 and, Y and Y' can independently be hydrogen and a halogen.

4,182,839

PROCESS FOR THE PREPARATION OF CATIONICALLY MODIFIED FORMALDEHYDE RESINS OF PROLONGED STABILITY

Gerard Tesson, Auzouer en Touraine, France, assignor to Manufacture de Produits Chimiques Protex Societe Anonyme, Paris, France

Continuation of Ser. No. 600,906, Jul. 31, 1975, abandoned. This application Jun. 30, 1978, Ser. No. 921,008
Claims priority, application France, Jul. 31, 1974, 74 27207
Int. Cl.[2] C08G *12/32*
U.S. Cl. 528—254 1 Claim

1. A process for the preparation of a cationic resin soluble in water and stable in solution which comprises the steps of:

(a) methylolating melamine with formaldehyde in methanol in contact with at least one compound selected from the group which consists of primary and secondary aliphatic amines, alkanolamines, polyamines and salts thereof for a period of 15 minutes to two hours at a temperature of 60° to 85° C. and an alkaline pH of 7.5 to 10;

(b) thereafter carrying out a methylation-condensation reaction with the reaction product of step (a) at a pH of 5 to 6 to obtain a minimum viscosity of 17 seconds at 20° C. by a consistometric head AFNOR No. 6; and

(c) thereafter terminating the methylation reaction with the viscosity between a minimum of 17 seconds and up to 100 seconds and condensing the formaldehyde thus added with the reaction system of step (b) for a period of thirty minutes to two hours at a temperature of 60° to 90° C. and at a pH of 5.5 to 7.

4,182,840

CROSS-LINKABLE SATURATED POWDEROUS COMPOSITIONS AND POWDEROUS PAINTING AND COATING COMPOSITIONS CONTAINING SAME

Jacques Meyer, Paris, and Daniel Bernelin, Ris-Orangis, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Sep. 16, 1977, Ser. No. 833,953
Claims priority, application France, Sep. 22, 1976, 76 28415; May 9, 1977, 77 14039; Jul. 11, 1977, 77 21240
Int. Cl.[2] C08G *63/76, 18/82, 59/16*
U.S. Cl. 525—437 38 Claims

1. A composition of matter comprising:

(a) at least one cross-linkable resin selected from the group consisting of saturated polyester resins;

(b) a cross-linking agent therefor having functional groups selected from the group consisting of acid groups and acid anhydride groups; and,

(c) a salt of an at least bivalent metal ion and an organic acid anion selected from the group consisting of carboxylic anions and acetylacetonate;

wherein the amount of said cross-linking agent is such that the number of active functional groups therein is about stoichiometrically equal to the number of active functional groups of the cross-linkable resin and wherein the by-weight ratio between the at least bivalent metal ion and the cross-linkable resin is between about 0.1:100 and 1.5:100.

4,182,841

COMPOSITION OF COPOLYESTERS

Jack D. Hauenstein, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 12, 1978, Ser. No. 914,643
Int. Cl.[2] C08G *63/76*
U.S. Cl. 525—437 4 Claims

1. A composition selected from the group consisting of polyethylene terephthalate homopolyester and ethylene terephthalate/neopentyl terephthalate copolyester wherein the bound ratio of ethylene to neopentyl structural units in said copolyester ranges from 70/30 to 80/20, said composition containing a polyfunctional compound having more than two reactive functional groups in an amount sufficient to provide cross link sites in said composition equivalent to one-third of the theoretical gelation concentration of said composition to increase the melt viscosity and strength thereof in the molten state.

4,182,842

POLY(ESTER-AMIDES)PREPARED FROM AN AROMATIC DICARBOXYLIC ACID, ETHYLENE GLYCOL AND A P-ACYLAMINOBENZOIC ACID

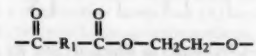
Winston J. Jackson, and Herbert F. Kuhfuss, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 888,258, Mar. 20, 1978, abandoned, which is a continuation of Ser. No. 822,984, Aug. 8, 1977, abandoned. This application Nov. 3, 1978, Ser. No. 957,127
Int. Cl.[2] C08G *63/18*
U.S. Cl. 528—292 8 Claims

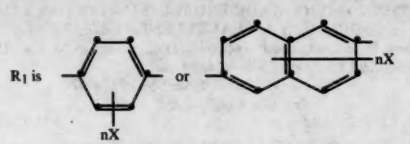
1. A process comprising

(I) preparing a fragmented poly(ester-amide) by contacting within a temperature range of about 250° to about 300° C.

(A) a starting polyester having an inherent viscosity of at least about 0.2 comprised of divalent radicals corresponding to the formula

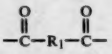


wherein

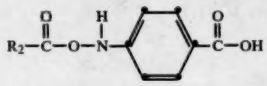


wherein X is Cl—, Br—, or a monovalent alkyl radical having one to three carbon atoms and n is 0, 1 or 2, and

(B) from about 10 to about 35 mole percent, based on the total moles of p-acylaminobenzoic acid and



combined, a p-acylaminobenzoic acid corresponding to the formula



wherein R_2 is phenyl or a monovalent alkyl radical of 1 to 8 carbon atoms, and

(2) preparing a final poly(ester-amide) having an inherent viscosity of at least 0.4 by increasing the inherent viscosity of the fragmented polyester by exposing the fragmented polyester to a suitable pressure and a suitable temperature.

5. Product of the process of claim 1.

4,182,843

METHOD FOR PRODUCING CASTINGS BY ACTIVATED ANIONIC POLYMERIZATION OF LACTAMS

Günter Haupt, Stadtbergen; Franz Fischer, Königsbrunn, and Arthur Handtmann, Biberach an der Riss, all of Fed. Rep. of Germany, assignors to Eltera Kunstoff-Technik GmbH, Fed. Rep. of Germany

Filed Jul. 21, 1977, Ser. No. 817,747

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1976, 2633560

Int. Cl.[2] C08G 69/44

U.S. Cl. 528—326 4 Claims

1. In a method for producing castings by the anionic polymerization of lauric lactam in which two melts are prepared separately, one containing the catalyst and one containing the activator, and the two melts are introduced to a gas-tight mold heated to substantially the temperature of the melts and polymerized therein, the improvement which comprises:

(a) initiating said polymerization under a vacuum sufficient to induce intense foaming of the melt and maintaining a vacuum in said mold until the viscosity of the polymerization mixture just prevents stirring, and

(b) continuing said polymerization from said time until completion under ambient pressure,

(c) the level of said vacuum being selected between a maximum of about 80 Torr when the ratio of the surface area of the casting exposed to the vacuum to the volume thereof is at a minimum, to a minimum of about 450 Torr when said ratio is at a maximum, and proportionately to the variation of said ratio at intermediate values thereof according to the formula $S/V \times T = K$ in which S is said surface area exposed to the vacuum, V is said volume, T is the time between the initiation of the polymerization and said time when the viscosity of the mixture just prevents stirring, and K is a constant.

4,182,844

PREPARATION OF POLYAMINOAMIDE RESIN IN THE ABSENCE OF WATER

Vincent P. Kuceski, Elmwood Heights, Ill., assignor to The C.P. Hall Company, Chicago, Ill.

Continuation-in-part of Ser. No. 754,644, Dec. 27, 1976, abandoned, which is a continuation of Ser. No. 403,131, Jan. 2, 1974, abandoned. This application Sep. 1, 1978, Ser. No. 938,777

Int. Cl.[2] C08G 69/28

U.S. Cl. 528—335 9 Claims

1. In a method of preparing a polyaminoamide, including the steps of reacting a polyalkylene polyamine with an alkyl ester of a straight-chain unsubstituted dicarboxylic acid in which the dicarboxylic acid group is (a) aromatic or (b) saturated or unsaturated aliphatic, and contains 2 to 36 carbon atoms in a reaction vessel in the substantial absence of water by adding sufficient heat to the reactants to initiate the reaction, the improvement comprising removing said heat from said reactants to allow the reaction to proceed with the exothermic heat of reaction as substantially the only heat supplied to said reactants until a majority of said reactants have reacted to form a polyaminoamide, while removing an alcohol reaction product from said reaction vessel.

4,182,845

PREPARATION OF POLYAMIDE THERMOPLASTIC ADHESIVE FROM POLYOXYPROPYLENE POLYAMINE AND PIPERAZINE

Ernest L. Yeakey, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Division of Ser. No. 851,013, Nov. 14, 1977, which is a division of Ser. No. 659,873, Feb. 20, 1976, Pat. No. 4,128,525, which is a continuation-in-part of Ser. No. 528,458, Nov. 29, 1974, abandoned. This application Jun. 29, 1978, Ser. No. 920,903

Int. Cl.[2] C08G 69/28

U.S. Cl. 528—340 5 Claims

1. A process for preparing a polyamide polymer useful as a thermoplastic adhesive having a melting point between about 20° C. to about 180° C. and improved adhesive strength comprising the steps of:

mixing and reacting (1) a polyoxypropylene polyamine having an average molecular weight of about 190 to about 3,000 selected from the group consisting of diamines, triamines, and mixtures thereof, (2) piperazine, and (3) an aliphatic or aromatic dicarboxylic acid, ester or anhydride having from about 4 to about 20 carbon atoms per molecule at a temperature of from about 175° C. to about 270° C. for a time period of from about 1 to about 12 hours, said polyoxypropylene polyamine, piperazine and said dicarboxylic acid, ester or anhydride being admixed in amounts sufficient to provide a molar ratio of total amine present:acid present of from about 0.25:1.0 to about 4.0:1.0; and

recovering the resulting resinous polyamide reaction product.

4,182,846

FLUORINE-CONTAINING COPOLYMERS, AND THEIR PRODUCTION AND USE

Takeo Saegusa, Kyoto; Akira Yamada, Osaka; Masaaki Iwase, Takarazuka, and Akitoshi Iwatani, Suita, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

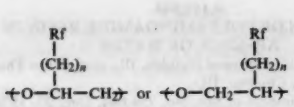
Filed May 11, 1978, Ser. No. 905,057

Claims priority, application Japan, May 12, 1977, 52-55075

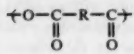
Int. Cl.[2] C08G 69/44

U.S. Cl. 528—341 18 Claims

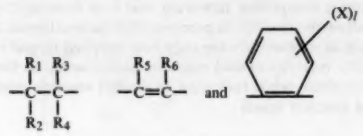
1. A fluorine-containing copolymer comprising as the essential constituting units (a) a group of the formula:



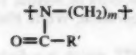
wherein Rf is a perfluoroalkyl group having 3 to 21 carbon atoms and n is an integer of 0 or 1, (b) a group of the formula:



wherein R is one of the groups of the formula:



wherein R_1 to R_6 is a hydrogen atom or a lower alkyl group, R_1 and R_3 being optionally combined together to form a cyclic ring, X is a halogen atom or a lower alkyl group and l is an integer of 0 to 4 and (c) a group of the formula:



wherein R′ is a hydrogen atom, an alkyl group or an aryl group and m is an integer of 2 or 3.

4,182,847

MONOMERS FOR POLY(METHYLENEBENZOATE) POLYMERS FROM TOLUIC ACID COMPOUNDS

Ellis K. Fields, River Forest; Steven A. Cerefice, Naperville, and Edward E. Paschke, Glen Ellyn, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 779,706, Mar. 21, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 915,826

Int. Cl.[2] C08G *63/02*

U.S. Cl. 528—361 **11 Claims**

1. A process for preparing linear polyesters of hydroxymethylbenzoic acid from acetoxylated hydroxymethylbenzoic acid compounds which comprises (1) the electrolytic anodic side-chain acetoxylation of a solution comprising a toluic acid methyl ester compound, a non-nucleophilic media of glacial acetic acid and a supporting electrolyte consisting essentially of tetraalkylammonium tetrafluoroborate by applying a source of direct current to said solution at temperatures of from about −30° to 110° C., (2) isolating an acetoxylated hydroxymethylbenzoic acid compound, and (3) polymerizing the said acetoxylated hydroxymethylbenzoic acid compound by transesterester exchange.

4,182,848

PHOTOCURABLE COMPOSITIONS

Claude J. Schmidle, and Robert Barclay, Jr., both of Trenton, N.J., assignors to Thiokol Corporation, Newtown, Pa.

Division of Ser. No. 720,531, Sep. 7, 1976. This application Sep. 20, 1978, Ser. No. 944,119

Int. Cl.[2] C08F *28/04, 2/48*

U.S. Cl. 528—376 **9 Claims**

1. A photocurable composition which comprises a polythiol and a polyene derived from a vinyl acetal.

4,182,849

COPOLYMERS MADE FROM DIVINYL AROMATIC COMPOUNDS AND ALKYLENE POLYAMINES

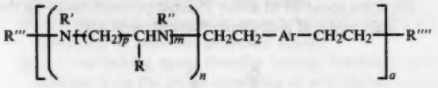
Bobby R. Ezzell, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 19, 1978, Ser. No. 917,047

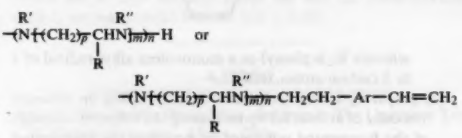
Int. Cl.[2] C08F *12/34, 12/36*

U.S. Cl. 528—392 **15 Claims**

1. New copolymers of amines and divinyl aromatic compounds having the formula:



wherein m is 0–1, n is 1–6, p is 0–4; R is hydrogen, methyl, ethyl or propyl; R′ and R″, which may be the same or different, are hydrogen, phenyl, benzyl, phenethyl, $—CH_2C-H_2—Ar—C_2H_5$, $—(CH_2)_xCH_3$, or $—(CH_2)_yN[(CH_2)_zCH_3]_2$ wherein x is 0–21, y is 2–6 and z is 0–4; R‴ is hydrogen, $—CH_2CH_2—Ar—C_2H_5$ or $—CH_2CH_2—Ar—CH=CH_2$; R⁗ is hydrogen,



wherein R, R′, R″, m, n, p, x, y, and z have the aforesaid meaning and wherein Ar is an aromatic-derived radical and a is 4–50.

2. A process for making copolymers of amines and divinyl aromatic compounds which comprises reacting an amine having at least two active hydrogens attached to nitrogens with a divinyl aromatic compound in the presence of a non-hydroxyl base wherein the ratio of amine to vinyl group is 0.25:1 to 1:1, based on primary amine equivalents in the case of primary amines and on nitrogen equivalents in the case of di-secondary amines.

4,182,850

NON-SOLVENT PRECIPITATION OF POLYMER COMPOSITION

Cary S. Marshall, Danville, and Robert S. Steffanson, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

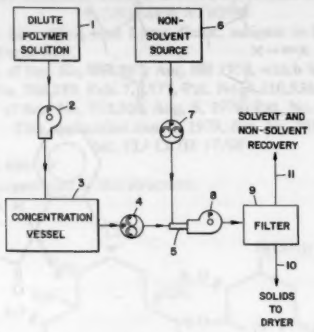
Filed Dec. 19, 1977, Ser. No. 861,609

Int. Cl.[2] C08J *3/14;* **C08G** *63/62*

U.S. Cl. 528—480 **8 Claims**

1. A method for recovering solid polycarbonate polymer from a polycarbonate-solvent solution which comprises introducing concurrently into a high speed shearing chamber a stream of said solution and a turbulent stream of a non-solvent for said polycarbonate polymer, said non-solvent being maintained at a temperature which is maintained below the boiling

point of the polycarbonate solvent, to form a mixture comprising solid polycarbonate polymer particles, solvent and non-solvent and thereafter separating said solid particles from said solvent and non-solvent.



4,182,851

PROCESS FOR REDUCING THE RESIDUAL MONOMER CONTENT IN THE POLYMERIZATION OF VINYL-LACTAMS AND VINYL ESTERS

Ferdinand Straub, Hockenheim; Herbert Spoor, Limburgerhof; Hans-Uwe Schenck, Wachenheim, and Wolfgang Schwarz, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 27, 1978, Ser. No. 919,449

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1977, 2730017

Int. Cl.[2] C08F *6/10, 218/04, 218/08*

U.S. Cl. 528—491 **5 Claims**

1. A process for reducing the residual monomer content in a polymer solution obtained from the copolymerization of vinyl ester and N-vinyl-lactams in a solvent, the copolymer produced containing from 10 to 90% by weight of N-vinyl-lactam and from 90 to 10% by weight of vinyl ester, based on the monomers, which comprises:

(a) polymerizing the vinyl esters and N-vinyl-lactams to completion of the polymerization reaction at temperatures of from 45° to 100° C.;

(b) adding from 0.05 to 0.5% by weight, based on the monomers employed, of at least one peroxide selected from the group consisting of di-tert.-butyl peroxide, di-tert.-amyl peroxide, dicumyl peroxide, 2,5-dimethyl-2,5-bis-(tert.-butylperoxy)-hexane, 2,2-bis-(tert.-butyl peroxy)-butane, 1,1-bis-(tert.-butylperoxy)-3,3,5-trimethylcyclohexane or 4,4-di-(tert.-butylperoxy)-butyl valerate, and then

(c) after-polymerizing the mixture obtained from step (b) at temperatures of from 110° to 160° C. to reduce the residual monomer content to a value less than about 0.1%.

4,182,852

PROCESS FOR REFINING A HOMOPOLYMER OF COPOLYMER OF PROPYLENE

Akinobu Shiga; Kiyoshi Matsuyama; Masahiro Kakugo, and Takatoshi Suzuki, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 27, 1978, Ser. No. 881,314

Claims priority, application Japan, Feb. 25, 1977, 52-20751

Int. Cl.[2] C08F *6/28*

U.S. Cl. 528—494 **4 Claims**

1. In a process for producing a homopolymer or copolymer of propylene comprising polymerizing propylene or copolymerizing propylene and at least one other unsaturated hydrocarbon monomer in liquid propylene using a catalyst containing activated titanium trichloride and an organo-aluminum compound, the activated titanium trichloride being prepared by reducing titanium tetrachloride with an organo-aluminum compound followed by activation, to produce a polymer slurry; introducing the polymer slurry produced into the top of a counter-current washing tower; and washing the polymer slurry by counter-currently contacting the polymer slurry with liquid propylene introduced into the bottom of the washing tower, the improvement which comprises refining the homopolymer or copolymer of propylene by feeding (a) an alcohol having 3 to 8 carbon atoms in a molar amount of about 0.1 to about 10 times the molar amount of the organo-aluminum compound in the slurry, or (b) a mixture of an alcohol having 3 to 8 carbon atoms in a molar amount of about 0.1 to about 10 times the molar amount of the organo-aluminum compound in the slurry and an epoxide in a molar amount of about 0.1 to about 3 times the molar amount of the organo-aluminum compound in the slurry, to a part of said washing tower, thereby simultaneously deactivating the catalyst and removing the catalyst and the homopolymer or copolymer of propylene dissolved in the polymer slurry.

4,182,853

PROCESS OF BREAKING UP GEL OF POLYAMIDE-IMIDE

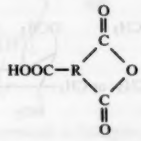
Daniel Kruh, East Brunswick, N.J., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 734,861, Jun. 6, 1968, abandoned. This application Oct. 3, 1973, Ser. No. 402,955

Int. Cl.[2] C08G *73/14*

U.S. Cl. 528—503 **1 Claim**

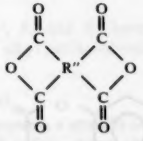
1. The process for making a useful material from the gelled composition comprising the reflux reaction product in a compatible solvent of x moles of tricarboxylic monohydride having the formula



where R is a trivalent radical containing at least three carbon atoms and x is a number up to about 20 and x+1 mole of at least one diamine having the formula

$$H_2H—R'—NH_2$$

where R′ is a divalent aromatic group and where the ratio of x+1 to x is less than about 10 to 9, said reaction product being reacted with at least one dianhydride having the formula



where R″ is a tetravalent organic radical/containing at least two carbon atoms to form a gel containing polyamideimide amic acid which process comprises heating said gelled composition at a temperature of about 100° C. to 150° C. for at least one hour whereby said gel is broken.

4,182,854

PROCESS FOR REMOVING VOLATILE MATTER FROM STYRENE RESIN

Yukio Hozumi, Hirakata; Tuguo Kuwayama, and Yosinori Kuroda, both of Sakai, all of Japan, assignors to Daicel Ltd., Sakai, Japan

Continuation of Ser. No. 769,875, Feb. 18, 1977, abandoned. This application Jun. 20, 1978, Ser. No. 917,293
Claims priority, application Japan, Mar. 5, 1976, 51-23976
Int. Cl.[2] C08F *6/24*
U.S. Cl. 528—500 **5 Claims**

1. A process for removing volatile matter from styrene resin, which consists essentially of the steps of continuously blowing a stream of steam at a velocity of above 100 m/sec directly into a charge of a suspension of styrene resin particles in hot water and contained in a pressure vessel, said steam being blown into said charge through nozzle means submerged in said charge, said styrene resin containing volatile matter therein, the temperature and pressure of said steam being effective to maintain the contents of said pressure vessel under a temperature of from 120° to 150° C. and a pressure of from 1.4 to 4.0 Kg/cm^2 gage, and simultaneously continuously mechanically agitating said suspension during the blowing of said steam thereinto so that a vapor phase of steam and said volatile matter can freely escape from the liquid phase; and continuously removing from the vessel a vapor stream consisting essentially of steam and volatile matter separated from said styrene resin.

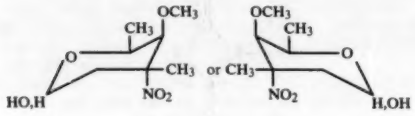
4,182,855

NITROSUGAR

Herman Hoeksema, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 874,767, Feb. 6, 1978, Pat. No. 4,137,410, which is a continuation-in-part of Ser. No. 793,785, May 5, 1977, abandoned. This application Aug. 31, 1978, Ser. No. 938,606
Int. Cl.[2] C07H *5/04*
U.S. Cl. 536—1 **2 Claims**

1. L or D-rubranitrose having the following structural formulas:



VI

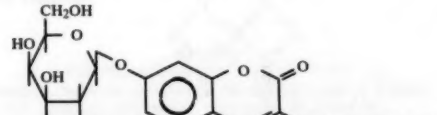
4,182,856

REAGENTS FOR USE IN BINDING ASSAYS TO DETERMINE DIPHENYLHYDANTOIN

Robert T. Buckler, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

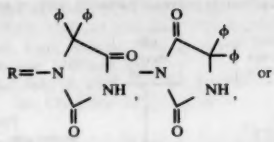
Filed Apr. 25, 1978, Ser. No. 899,844
Int. Cl.[2] C07H *17/00, 17/04*
U.S. Cl. 536—4 **5 Claims**

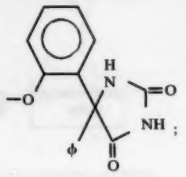
1. A β-galactosyl-umbelliferone-diphenylhydantoin conjugate of the formula:



wherein

n=2 through 6;





φ=phenyl.

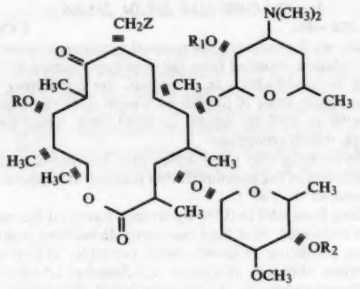
4,182,857

SEMI-SYNTHETIC OLEANDOMYCIN DERIVATIVES - C_8 MODIFICATIONS

Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 894,897, Apr. 10, 1978, which is a division of Ser. No. 766,219, Feb. 7, 1977, Pat. No. 4,110,530, which is a division of Ser. No. 712,360, Aug. 6, 1976, Pat. No. 4,036,853. This application Jan. 4, 1979, Ser. No. 834
Int. Cl.[2] C07H *17/08*
U.S. Cl. 536—9 **2 Claims**

1. A compound of the structure:



and the pharmaceutically acceptable acid addition salts thereof wherein:

R is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

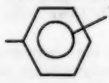
R_1 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_2 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

Z is $—NHR_5$;

R_5 is $—SO_2R_7$; and

R_7 is selected from the group consisting of alkyl having from one to six carbon atoms and



said substituent Y being selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms, chloro and $—CF_3$.

4,182,858

SEMI-SYNTHETIC OLEANDOMYCIN DERIVATIVES - C_8 MODIFICATIONS

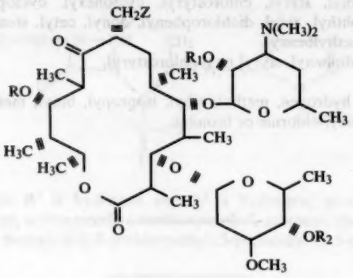
Frank C. Sciavólino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 894,897, Apr. 10, 1978, which is a division of Ser. No. 766,219, Feb. 7, 1977, Pat. No. 4,110,530, which is a division of Ser. No. 712,360, Aug. 6, 1976, Pat. No. 4,036,853. This application Jan. 4, 1979, Ser. No. 818

Int. Cl.[2] C07H *17/08*

U.S. Cl. 536—9 **4 Claims**

1. A compound of the structure:



and the pharmaceutically acceptable acid addition salts thereof wherein:

R is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

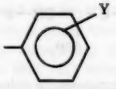
R_1 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_2 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

Z is $—OR_4$;

R_4 is SO_2R_7;

R_7 is selected from the group consisting of alkyl having from one to six carbon atoms and



said substituent Y being selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms, chloro and $—CF_3$.

4,182,859

PROCESS FOR THE PREPARATION OF 2'-DEOXYRIBOFURANOSYL NUCLEOSIDES

Siegfried Erhardt, Esslingen-Zel, Fed. Rep. of Germany, assignor to Robugen GmbH Pharmaceutische Fabrik, Esslingen-Zel, Fed. Rep. of Germany

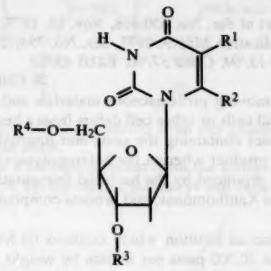
Filed May 10, 1978, Ser. No. 904,570

Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721466

Int. Cl.[2] C07H *17/00*

U.S. Cl. 536—23 **13 Claims**

1. A process for the preparation of substantially pure β-anomers of 2'-deoxyribofuranosyl nucleosides of the formula:



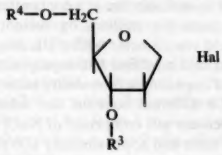
I

wherein

R^1 represents a hydrogen atom, a straight-chain or branched alkyl group of 1 to 6 carbon atoms, a phenyl or benzyl group, a methoxy group, a halogen atom, a nitro group, a nitrile group, or an amino group which is unsubstituted or mono- or disubstituted by alkyl residues of 1 to 6 carbon atoms, or in which the nitrogen atom thereof can be part of a 5- or 6-membered ring, or a perfluoroalkyl group of 1 to 6 carbon atoms;

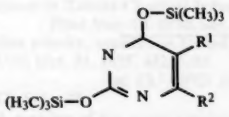
R^2 is a hydrogen atom or a halogen atom; and

R^3 and R^4 represents a benzoyl, tolyl, p-chlorobenzoyl, or p-nitrobenzoyl group, which comprises reacting a 1-halogen derivative of a blocked 2-deoxy-D-ribose having the formula:



II

wherein Hal represents a halogen atom, with a silylated pyrimidine derivative having the formula:



III

wherein R^1, R^2, R^3 and R^4 have the above-indicated meanings, in an alkyl nitrile solvent having the formula:

$R^5—C≡N$ IV

wherein R^5 represents a straight-chain or branched alkyl group of 1 to 4 carbon atoms, and in the presence of a mercury(II) salt at a temperature of about −10° to about +40° C.; precipitating the desired β-anomer as the only insoluble component by allowing the reaction mixture to stand at a temperature of between about −3° C. to 20° C.; and separating the thus-precipitated β-anomer from the reaction mixture.

4,182,860

MODIFIED HETEROPOLYSACCHARIDES AND THEIR PREPARATION

Lars A. Naslund, Morganville, N.J., and Allen I. Laskin, New York, N.Y.

Continuation-in-part of Ser. No. 630,468, Nov. 10, 1975, abandoned. This application May 9, 1977, Ser. No. 794,725

Int. Cl.[2] C12D *13/04;* C08B *37/00;* E21B *43/22*

U.S. Cl. 536—114 28 Claims

1. A process for removing proteinaceous materials and/or residual whole bacterial cells or other cell debris from a heteropolysaccharide product containing the same and improving the filterability of the product wherein the heteropolysaccharide product has been produced by the bacterial fermentation of bacteria of the genus Xanthomonas, said process comprising the steps:

(a) preparing an aqueous solution which contains (i) from about 200 to about 30,000 parts per million by weight, of said heteropolysaccharide product, and (ii) at least about 0.5 weight percent of at least one inorganic salt to obtain a saline heteropolysaccharide solution;

(b) heating said saline heteropolysaccharide solution to a temperature of at least about 100° C.;

(c) maintaining said saline heteropolysaccharide solution at a temperature of at least about 100° C. for a period of time sufficient to increase the injectivity and filterability characteristics of the heteropolysaccharide but for an insufficient time to impair the viscosity imparting properties of the saline-heat treated heteropolysaccharide; and

(d) removing or separating the proteinaceous materials and/or residual whole bacterial cells or other cell debris from the saline and heat-treated heteropolysaccharide product to thereby obtain a modified heteropolysaccharide capable of imparting a viscosity of at least 4.0 centipoises to an aqueous test solution containing 2 weight percent NaCl and 0.2 weight percent $CaCl_2$ when said modified heteropolysaccharide is added to said solution at a concentration of approximately 600 parts per million, by weight, as measured on a Brookfield viscosimeter with a UL adapter at 60 rpm at 25° C. and said modified heteropolysaccharide is further capable of imparting a filterability such that more than 1000 ml of a different aqueous test solution containing 8.8 weight percent salt comprised of NaCl and $CaCl_2$ on a 10:1 weight ratio and approximately 600 parts per million concentration, by weight, of said modified heteropolysaccharide will pass without plugging through a Millipore ® filter having a diameter of 13 mm and a pore size of about 5 microns at a constant pressure drop of about 1.55 psig.

4,182,861

FLUORESCENT 1,2,3-TRIAZOLE DERIVATIVES OF 3-PHENYLCOUMARIN

Fritz Fleck, Bottmingen; Hans Balzer, Munchenstein, and Horst Aebli, Basel, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

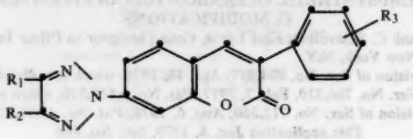
Continuation-in-part of Ser. No. 572,005, Apr. 28, 1975, Pat. No. 4,006,158, which is a continuation of Ser. No. 695,330, Jan. 3, 1968, abandoned. This application Dec. 30, 1976, Ser. No. 755,459

Claims priority, application Switzerland, Jan. 5, 1967, 108/67

Int. Cl.[2] C07D *405/04, 405/10;* C09K *1/02*

U.S. Cl. 542—441 4 Claims

1. A compound of the formula



wherein

R_1 is hydrogen, methyl, ethyl, isopropyl, phenyl, diphenyl, benzyl, tolyl, methoxyphenyl, butyl, chlorophenyl, chlorotolyl, styryl, chlorostyryl, cyclohexyl, cyclopentyl, naphthyl, xylyl, dichlorophenyl, nonyl, cetyl, stearyl or dimethylbenzyl,

R_2 is diphenyl, styryl or p-chlorostyryl,

and

R_3 is hydrogen, methyl, ethyl, isopropyl, butyl, methoxy, ethoxy, chlorine or bromine.

4,182,862

PROCESS FOR THE PREPARATION OF 1,3-DISUBSTITUTED-2-AZOYL-2-PROPEN-1-ONES

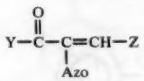
Hak-Foon Chan, Doylestown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 18, 1978, Ser. No. 952,435

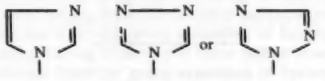
Int. Cl.[2] C07D *233/60, 401/06, 405/06, 409/06*

U.S. Cl. 542—440 6 Claims

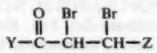
1. In the process for the preparation of compounds of the formula



wherein Y and Z are independently selected from $(C_1$-$C_{12})$alkyl, phenyl, pyridyl, furyl or thienyl or phenyl, pyridyl, furyl or thienyl substituted with up to three substituents selected from the group consisting of halogen, nitro, cyano, $(C_1$-$C_4)$alkoxy or $(C_1$-$C_4)$alkyl; and Azo is a group of the formula



the improvement which comprises reacting a dibromoketone of the formula



wherein Y and Z are defined as above with a heterocyclic compound of the formula

Azo-H

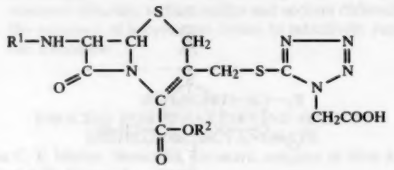
wherein Azo is as defined above, at temperature from about 60° C. to about 180° C. either neat or in the presence of an inert solvent.

4,182,863
7-AMINO-3-(1-CARBOXYMETHYLTETRAZOL-5-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACID

William J. Gottstein, Fayetteville; Murray A. Kaplan, Syracuse, and Alphonse P. Granatek, Baldwinsville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 590,971, Jun. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 502,991, Sep. 3, 1974, abandoned. This application Aug. 5, 1976, Ser. No. 712,111
Int. Cl.[2] C07D *501/18*
U.S. Cl. 544—26 11 Claims

1. A compound having the formula



wherein R^1 is hydrogen and R^2 is hydrogen, pivaloyloxymethyl, acetoxymethyl, methoxymethyl, acetonyl, phenacyl, p-nitrobenzyl, β,β,β-trichloroethyl, 3-phthalidyl or 5-indanyl.

4,182,864
TRIETHYLENEDIAMINE PROCESS

Edward C. Y. Nieh, and George P. Speranza, both of Austin, Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,538
Int. Cl.[2] C07D *295/02*
U.S. Cl. 544—352 5 Claims

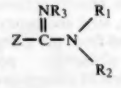
1. An improved process for directly recovering a substantially pure triethylenediamine solute in a liquid tertiary amine solution from a crude triethylenediamine reaction product mixture obtained from a liquid phase process for the preparation of triethylenediamine comprising the steps of admixing a tertiary amine with said crude triethylenediamine reaction product mixture to form a crude triethylenediamine reaction product-tertiary amine admixture; distilling said admixture under conditions such that said triethylenediamine and said tertiary amine are codistilled; and collecting the resultant codistillate as a substantially pure triethylenediamine solute in liquid tertiary amine solution.

4,182,865
DIAZA-CYCLIC DERIVATIVES OF GUANIDINE

Chris R. Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Inc., Fort Washington, Pa.

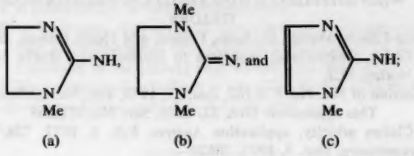
Filed Sep. 18, 1978, Ser. No. 943,098
Int. Cl.[2] C07D *413/02, 233/48*
U.S. Cl. 544—60 8 Claims

1. A diaza heterocyclic derivative of guanidine selected from the group consisting of a compound having the formula:



and the pharmaceutically acceptable acid addition salts thereof wherein:

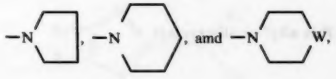
Z is a member selected from the group consisting of:



R_1 is a member selected from the group consisting of methyl and ethyl;

R_2 is a member selected from the group consisting of loweralkyl, cyclopentyl, cyclohexyl and benzyl;

taken together represents a member selected from the group consisting of:



wherein W is a member selected from the group consisting of O, S, N-loweralkyl and N-phenyl; and

R_3 is a member selected from the group consisting of:

alkyl having from 4 to 10 carbons;

phenyl; methylenedioxyphenyl; phenyl substituted with from 1 to 3 substituents each selected from the group consisting of halo, loweralkyl and loweralkoxy; and phenyl substituted with a member selected from the group consisting of hydroxy, benzyloxy, nitro; trifluoromethyl and methylthio;

naphthyl; cyclopentyl; cyclohexyl; exo-2-norbornyl; endo-2-norbornyl; 1-adamantyl;

arylalkyl in which the aryl function is phenyl and the alkyl function has from 1 to 4 carbons; and

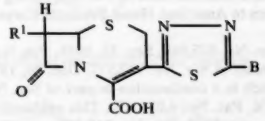
diphenylalkyl in which the alkyl function has from 1 to 2 carbons.

4,182,866
3-HETEROCYCLIC SUBSTITUTED CEPHEM COMPOUNDS

Takuichi Miki, Amagasaki; Taisuke Matsuo, Ibaraki; Tohru Sugawara, Otsu, and Hirotomo Masuya, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed May 10, 1976, Ser. No. 684,738
Claims priority, application United Kingdom, May 12, 1975, 19912/75; Oct. 31, 1975, 45236/75
Int. Cl.[2] C07D *501/20*
U.S. Cl. 544—27 8 Claims

1. A member of the group consisting of a compound of the formula



and a pharmaceutically acceptable salt thereof, wherein R^1 represents 2-thienylacetamido or 2-(2-iminothiazolin-4-yl)-acetamido and B represents lower alkyl, phenyl, methylamino, dimethylamino, N-methyl-N-acetylamino or acetylamino.

4,182,867

6-[3,6-DIHYDRO-1(2H)-PYRIDYL]-PYRIMIDINE-3-OXIDES

Jean-Claude Muller, Rixheim, France, and Henri Ramuz, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

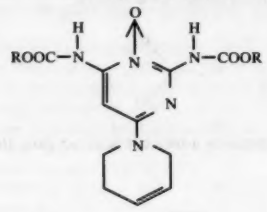
Division of Ser. No. 873,182, Jan. 27, 1978, Pat. No. 4,150,132. This application Dec. 22, 1978, Ser. No. 972,607

Claims priority, application Austria, Feb. 4, 1977, 738/77; Luxembourg, Dec. 5, 1977, 78639

Int. Cl.[2] C07D *401/04*

U.S. Cl. 544—324 **7 Claims**

1. A compound of the formula



II

wherein R is alkyl or alkoxyalkyl.

4,182,868

7-METHOXYCEPHALOSPORIN DERIVATIVES

Michihiko Ochiai, Suita; Akira Morimoto, Ikeda; Yoshihiro Matsushita, Nishinomiya; Osami Aki, Kawanishi; Taiiti Okada, Kyoto, and Kenji Kawakita, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 603,236, Aug. 8, 1975, abandoned. This application May 6, 1977, Ser. No. 794,818

Claims priority, application Japan, Oct. 29, 1974, 49-125130

Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—21 **3 Claims**

1. A compound selected from the group consisting of 7α-methoxy-7β-(2-aminothiazol-4-ylacetamido)-3-(1-methyl-1H-tetrazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid and a pharmaceutically acceptable salt thereof.

4,182,869

4-CARBOBENZOXYPIPERAZINE-2-CARBOXYLIC ACID CHEMICAL INTERMEDIATE

Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 835,560, Sep. 22, 1978, Pat. No. 4,138,567, which is a division of Ser. No. 752,577, Dec. 20, 1976, Pat. No. 4,089,958, which is a continuation-in-part of Ser. No. 668,872, Mar. 22, 1976, Pat. No. 4,032,639. This application Sep. 25, 1978, Ser. No. 945,356

Int. Cl.[2] C07D *241/24*; A61K *31/495*

U.S. Cl. 544—388 **1 Claim**

1. The compound which is 4-carbobenzoxypiperazine-2-carboxylic acid or the salts thereof.

4,182,870

PREPARATION OF 3-BROMOMETHYL-3-CEPHEM SULFOXIDES

Cornelis A. Bruynes, Koudekerk, and Jan J. de Koning, Rijswijk, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

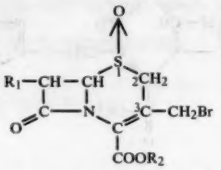
Filed Aug. 30, 1978, Ser. No. 937,989

Claims priority, application United Kingdom, Sep. 7, 1977, 37413/77

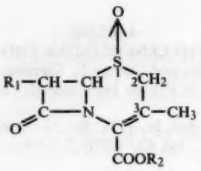
Int. Cl.[2] C07D *501/04*

U.S. Cl. 544—16 **15 Claims**

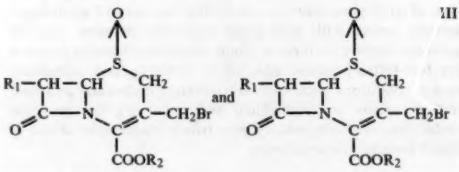
1. A process for the preparation of a compound of the formula



wherein R_1 is an acylamino and R_2 is a group protecting the carboxy radical comprising brominating a compound of the formula



wherein R_1 and R_2 have the above definition to obtain a mixture of compounds of the formulae



III

and treating the mixture or the compound of formula III with a debrominating agent selected from the group consisting of

(a) phosphites of the formula

wherein R_3, R_4 and R_5 are individually selected from the group consisting of straight- or branched-chain alkyl optionally substituted with a chlorine atom and having 1 to 18 carbon atoms, phenyl optionally substituted with a methyl or chlorine, allyl and benzyl;

(b) phosphites selected from the group consisting of phenyl neopentylglycol phosphite, poly(dipropyleneglycol) phenyl phosphite, tris 25 phosphite and tris(dipropyleneglycol)phosphite;

(c) di- and triphosphites selected from the group consisting of diisodecyl pentaerythritol diphosphite, tetraphenyl dipropyleneglycol diphosphite, distearyl pentaerylthritol

diphosphite, diphenyl didecyl (2,2,4-trimethyl-1,3-pentanediol) diphosphite, tetrakis(nonylphenyl)polypropyleneglycol diphosphite and heptakis(dipropyleneglycol) triphosphite;
(d) di(lower alkyl) phenylphosphonites;
(e) lower alkyl diphenylphosphinites;
(f) phosphines and
(g) trivalent phosphorus compounds selected from the group consisting of hexamethylphosphorous triamide, 2-ethoxy-4-methyl-1,3,2-dioxaphospholane, 4-methyl-2-piperidino-1,3, 2-dioxaphospholane, diethyl N-methyl-N-phenylphosphoramidite and bis-o-phenylene pyrophosphite and an inorganic salt selected from the group consisting of stannous chloride, sodium sulfite and sodium dithionite in the presence of a hydrogen donor to selectively remove the 2-bromine.

4,182,871
PROCESS FOR SPRAY DRYING SODIUM DICHLOROISOCYANURATE

Jens C. T. Moller, Blouströd, Denmark, assignor to Niro Atomizer A/S, Denmark

Filed Feb. 27, 1978, Ser. No. 881,820
Int. Cl.[2] C07D *251/28*
U.S. Cl. 544—190 **19 Claims**

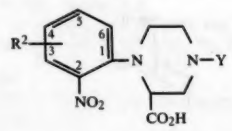
1. A process for the production of a stable, free-flowing particulate sodium dichloroisocyanurate dihydrate product comprising the steps of:
(a) forming a particulate sodium dichloroisocyanurate product having a moisture content in the range of about 12.0 to about 13.5% by weight and a temperature of about 60° C. to about 80° C. by spraying an aqueous solution or slurry of sodium dichloroisocyanurate spray with a heated drying gas flowing through said chamber;
(b) stabilizing said particulate product by agitating said product in a confined treating zone for a period of from about 1 to about 30 minutes, and at a temperature below which further reduction of the moisture content of said product will occur, whereby the water of hydration contained in said sodium dichloroisocyanurate product becomes uniformly distributed and firmly bound to said product;
(c) cooling the stabilized particulate product to a temperature below 40° C. in at least one fluidized or vibrating-fluidized bed; and
(d) recovering a dry, stable, free-flowing particulate sodium dichloroisocyanurate dihydrate product from said cooling step.

4,182,872
4-(LOWER)ALKYL-1-(O-NITROPHENYL)PIPERAZINE-2-CARBOXYLIC ACID CHEMICAL INTERMEDIATES

Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 835,560, Sep. 22, 1977, Pat. No. 4,138,567, which is a division of Ser. No. 752,577, Dec. 20, 1976, Pat. No. 4,089,958, which is a continuation-in-part of Ser. No. 668,872, Mar. 22, 1976, Pat. No. 4,032,639. This application Sep. 25, 1978, Ser. No. 945,357
Int. Cl.[2] C07D *241/24*; A61K *31/495*
U.S. Cl. 544—389 **2 Claims**

1. A compound of the formula:



wherein:
Y is (lower)alkyl or carbobenzoxy; and
R^2 is hydrogen, (lower)alkyl, (lower)alkoxy, chlorine, fluorine, trifluoromethyl, or trifluoroacetamido in the 3-, 4-, or 5-position of the phenyl ring; or the salts thereof.

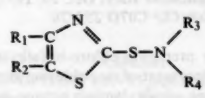
2. The compound as defined in claim 1 which is 4-methyl-1-(o-nitrophenyl)piperazine-2-carboxylic acid.

4,182,873
PROCESS FOR THE PREPARATION OF THIAZOLESULPHENAMIDES

Raymond Janin, Carmagnac-Irigny, France, assignor to Rhone-Poulenc S.A., Paris, France

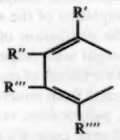
Continuation-in-part of Ser. No. 402,914, Oct. 2, 1973, abandoned, and Ser. No. 415,307, Nov. 13, 1973, abandoned. This application Jun. 2, 1975, Ser. No. 582,983
Int. Cl.[2] C07D *277/78*
U.S. Cl. 544—133 **13 Claims**

1. In a process for the preparation of a thiazolesulphenamide of the formula:



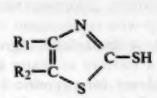
(I)

in which R_1 and R_2, which may be identical or different, are each hydrogen, halogen, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 5 carbon atoms, or aryl of 6 to 12 carbon atoms, or together form a divalent radical of the formula:



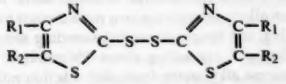
(II)

in which R′, R″, R‴ and R⁗, which may be identical or different, are each hydrogen, halogen, nitro, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 5 carbon atoms, or aryl of 6 to 12 carbon atoms, and R_3 and R_4, which may be identical or different, are each hydrogen atoms, a straight or branched alkyl of 1 to 20 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, or aralkyl of 7 to 15 carbon atoms, or, together with the nitrogen atom to which they are bonded, form a heterocyclic ring of 5 to 7 ring atoms of which 1 to 3 are hetero-atoms chosen from nitrogen, oxygen and sulphur and the remainder are carbon atoms, the said ring being unsubstituted or substituted by alkyl of 1 to 5 carbon atoms or alkoxy of 1 to 5 carbon atoms, by condensing a 2-mercapto-thiazole of the formula:



(III)

or a 2,2′-dithiazolyl disulphide of the formula:



(IV)

with a compound of the formula:

(V)

R_1, R_2, R_3 and R_4 having the meanings given above, in the presence of oxygen and a catalyst, the improvement which consists in using, as catalyst, copper, copper oxide, a salt of copper with an inorganic acid, a carboxylic acid, or a sulphonic acid, or a copper β-diketonate chelate.

4,182,874

PROCESS FOR THE PRODUCTION OF CHLORO-BIS(ALKYLAMINO)-S-TRIAZINES

Luciano Baldi, Turin; Giuliano Giorcelli, Borgaro T.se Turin, and Renato Francese, Turin, all of Italy, assignors to Rumianca S.p.A., Turin, Italy

Filed Oct. 20, 1978, Ser. No. 953,320

Claims priority, application Italy, Oct. 20, 1977, 28808 A/77

Int. Cl.[2] C07D *251/50*

U.S. Cl. 544—204 **9 Claims**

1. In a process for preparing chloro-bis(alkylamino)-s-triazine by step-wise replacement of two chlorine atoms of cyanuric chloride by means of alkylamino groups in an alkaline medium comprising water and a liquid organic compound which is a solvent for cyanuric chloride, in which a molar excess of alkylamine is used in the second replacement step and in which said organic compound is removed by distillation from the reaction mixture resulting from the second replacement step, the improvement which comprises adding to said reaction mixture, upon completion of the second replacement step, or during or after the distillation of the organic compound, at least 0.5% by weight with respect to the weight of the chloro-bis (alkylamino)-s-triazine, of one or more inorganic solids, said solids being selected from minerals belonging to the groups of montmorillonite, paligorskite, vermiculite and chlorite and having a base-exchange capacity of at least 10 milliequivalents for each 100 grams of said solid.

4,182,875

PRODUCTION OF CHLORO-BIS(ALKYLAMINO)-S-TRIAZINES

Renato Francese, and Roberto Esposito, both of Turin, Italy, assignors to Rumianca S.p.A., Turin, Italy

Filed Oct. 20, 1978, Ser. No. 953,319

Claims priority, application Italy, Oct. 20, 1977, 28810 A/77

Int. Cl.[2] C07D *251/50*

U.S. Cl. 544—204 **7 Claims**

1. In a process for preparing chloro-bis(alkylamino)-s-triazines by means of the step-wise replacement of two chlorine atoms of cyanuric chloride with alkylamino groups in an alkaline medium comprising a mixture of water and an organic compound which is a solvent for cyanuric chloride and in which a molar excess of alkylamine is used in the second replacement step, the method of suppressing the formation of tris(alkylamino)-s-triazines which comprises submitting the reaction mixture, after the second chlorine atom has been replaced with an alkylamine group, to a pressure not exceeding about 400 mm Hg, at a temperature not exceeding about 55° C. and for a period not exceeding about 15 minutes, thereby removing the excess alkylamine from said reaction mixture by volatilization without substantially removing said organic compound and the other components of the reaction mixture.

4,182,876

SUBSTITUTED-PHTHALAZONE 7-CARBOXYLIC ACID AND SALTS AND PROCESS FOR PREPARING SAME

Takio Shimamoto, No. 13, Kita-machi, Shinjuku-ku, Tokyo, and Masayuki Ishikawa, No. 14-13, Akatsutsumi 3-chome, Setagaya-ku, Tokyo, both of Japan

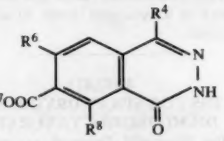
Filed Mar. 18, 1977, Ser. No. 779,112

Claims priority, application Japan, Mar. 18, 1976, 51/28592; Mar. 22, 1976, 51/29815

Int. Cl.[2] C07D *237/32;* **A61K** *31/50*

U.S. Cl. 544—237 **11 Claims**

1. A compound of the formula



wherein R^4 represents a carbamoyl group, a dialkylaminoalkylcarbamoyl group, a hydroxyalkylcarbamoyl group, an alkylidenehydrazinocarbonyl group, a hydrazinocarbonyl group, an alkylhydrazinocarbonyl group, an alkylhydrazonomethyl group, a hydroxyiminomethyl group, a dialkylhydrazonomethyl group, a carbamoylhydrazonomethyl group, an alkylidenehydrazonomethyl group, or a hydrazonomethyl group, R^6, R^7 and R^8 each represent an alkyl group of 1 to 6 carbon atoms, or a pharmaceutically acceptable acid addition salt thereof.

4,182,877

SUBSTITUTED ANTHRANILATES

Roger L. N. Harris, Aranda; John L. Huppatz, Weetangera; John N. Phillips, Yarralumla, and Barbara Witrzens, Holt, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

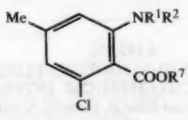
Filed May 10, 1977, Ser. No. 795,595

Claims priority, application Australia, May 12, 1976, PC5901

Int. Cl.[2] C07D *295/06;* **A61K** *31/245*

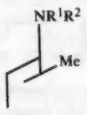
U.S. Cl. 544—172 **6 Claims**

1. A process for the production of a compound of the formula II:



II

wherein R^1 and R^2 are the same or different and selected from the group consisting of a hydrogen atom and alkyl and cycloalkyl groups (provided that R^1 and R^2 are not both hydrogen atoms), or R^1 and R^2 , together with the nitrogen atom to which they are attached, form a non-aromatic heterocyclic ring structure selected from the group consisting of a pyrrolidino, a piperidino and a morpholine group, and R^7 is an alkyl group, which comprises the self-condensation of a compound of the formula III



III

wherein R^1, R^2 and R^7 are as defined above, by reaction with

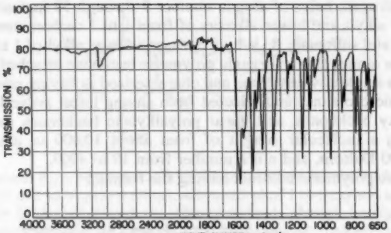
phosphorous oxychloride, to form a compound of the formula II.

4,182,878

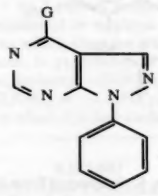
1-PHENYL-1H-PYRAZOLO[3,4-d]PYRIMIDINE-4-CARBONITRILE AND A METHOD FOR ITS PREPARATION

Eisaku Hayashi; Takeo Higashino, and Shin-ichi Suzuki, all of Shizuoka, Japan, assignors to The Lion Dentrifice Co., Ltd., Tokyo, Japan

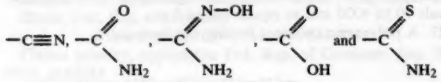
Filed Apr. 4, 1978, Ser. No. 893,527
Claims priority, application Japan, Aug. 27, 1977, 52/103022
Int. Cl.[2] A61K *31/415, 31/505;* C07D *487/04*
U.S. Cl. 544—262 2 Claims



1. A derivative of 1-phenyl-1H-pyrazolo[3,4-d]pyrimidine having the structural formula



where G is a group selected from the class consisting of



4,182,879

N-[3-METHYL-4-(2-METHYL-4-OXO-3,4-DIHYDRO-QUINAZOLIN-3-YL)PHENYL]SUCCINAMIC ACID

James G. Christenson, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 616,451, Sep. 24, 1975, Pat. No. 4,053,459.
This application Jul. 5, 1977, Ser. No. 813,205
Int. Cl.[2] C07D *239/91*
U.S. Cl. 544—290 1 Claim

1. N-[3-methyl-4-(2-methyl-4-oxo-3,4-dihydro-quinazolin-3-yl)-phenyl]succinamic acid.

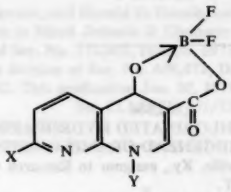
4,182,880

1,8-NAPHTHYRIDINE COMPOUNDS AND PROCESS FOR PREPARING THE SAME

Nanao Watanabe, Sakai, and Haruhito Akimoto, Osaka, both of Japan, assignors to Koei Chemical Co., Ltd., Osaka, Japan

Filed Dec. 13, 1978, Ser. No. 968,911
Claims priority, application Japan, Dec. 27, 1977, 52-159604
Int. Cl.[2] C07F *5/02;* C07D *487/04*
U.S. Cl. 546—13 22 Claims

1. A chelated 1,8-naphthyridine derivative having the following general formula:


[I]

wherein X and Y are independently a lower alkyl group.

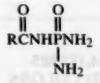
4,182,881

N-[DIAMINOPHOSPHINYL]ARYLCARBOXAMIDES

Allan V. Bayless, and Ozra E. Millner, Jr., both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 19, 1978, Ser. No. 925,968
Int. Cl.[2] C07D *213/00, 307/46;* C07F *9/22*
U.S. Cl. 546—22 24 Claims

1. A compound of the formula:



wherein R is 3-pyridyl, 2-furyl, 2-naphthyl, cinnamenyl, benzyl, phenyl or phenyl substituted by 3- or 4-nitro, 4-halo, 4-amino, 4-(lower)alkoxy, 4-(lower)alkyl, 2-methyl, 2,3-dimethyl, 2,4,6-trimethyl, 3-trifluoromethyl, 4-cyano, 4-phenyl, or 3-phenoxy.

4,182,882

PROCESS FOR THE PRODUCTION OF PYRANTHRONES OR FLAVANTHRONES

Jurgen Markert, Ettingen, and Hans Morawietz, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,203
Claims priority, application Switzerland, Mar. 22, 1977, 3570/77
Int. Cl.[2] C09B *3/42, 5/20*
U.S. Cl. 546—31 10 Claims

1. A process for the production of pyranthrones or flavanthrones (II), which comprises reacting substituted or unsubstituted 2,2'-dialkyl-1,1'-dianthraquinoyls or 2,2'-diacyl-amino-1,1'-dianthraquinoyls (I) respectively in a two-phase system of a mixture of water and a water-immiscible organic solvent or solvent mixture in the presence of 0.01 to 40 mole percent, based on the amount of the compound (I), of quaternary ammonium or phosphonium compounds as catalysts, with good stirring, in neutral to alkaline pH range between 80° and 130° C.

4,182,883
D-6-ALLYL-8-ERGOL-I-YLACETAMIDE

Miloš Beran; Jiří Křepelka; Miroslav Semonský; Karel Řežábek; Miroslav Šeda, and Marie Aušková, all of Prague, Czechoslovakia, assignors to Spofa, United Pharmaceutical Works, Prague, Czechoslovakia

Filed Dec. 6, 1977, Ser. No. 857,994
Claims priority, application Czechoslovakia, Dec. 6, 1976, 7932/76
Int. Cl.[2] C07D *457/02*; A61K *31/48*
U.S. Cl. 546—67 1 Claim

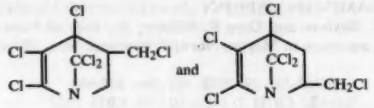
1. D-6-Allyl-8-ergolin-I-ylacetamide.

4,182,884
POLYCYCLIC CHLORINATED HYDROCARBONS CONTAINING BRIDGEHEAD OR IMINO NITROGEN

John L. Wong, Louisville, Ky., assignor to Research Corporation, New York, N.Y.

Division of Ser. No. 725,578, Sep. 22, 1976, Pat. No. 4,087,434. This application Feb. 17, 1978, Ser. No. 878,794
Int. Cl.[2] C07D *221/22*
U.S. Cl. 546—72 2 Claims

1. A mixture of compounds of the formulae:

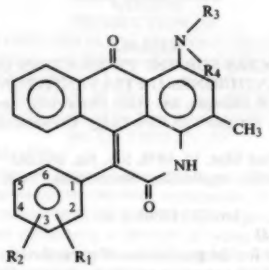


4,182,885
RED COLORS

Leonard A. Bunes, San Carlos, Calif., assignor to Dynapol, Palo Alto, Calif.

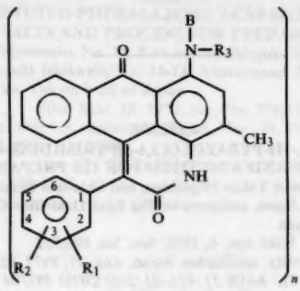
Filed Dec. 17, 1976, Ser. No. 751,857
Int. Cl.[2] C07D *221/18, 215/02*
U.S. Cl. 546—76 35 Claims

1. A monomeric colorant of the formula



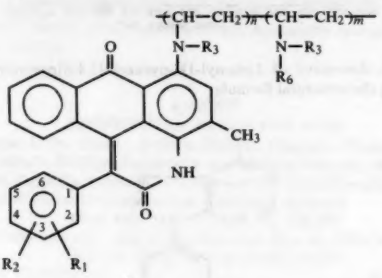
wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, halos of atomic number 9 through 53, inclusive, lower alkyls and lower alkoxies of from 1 to 3 carbon atoms, nitros, and sulfonates and wherein R_3 and R_4 independently are selected from the group consisting of hydrogen, lower alkyls of from 1 to 4 carbon atoms and lower alkyl sulfonates of from 1 to 4 carbon atoms.

11. A polymeric colorant having the formula



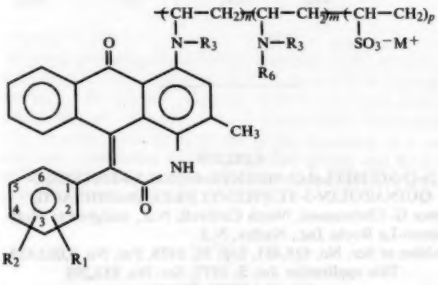
wherein R_1 and R_2 are independently selected from the group of hydrogen, halos of atomic number 9 through 53 inclusive, lower alkyls and lower alkoxies of from 1 to 3 carbon atoms, nitro, and sulfonate; R_3 is hydrogen or a lower alkyl of 1 to 3 carbon atoms, B is an organic polymeric backbone attached to N by a single covalent bond and characterized as having essentially no crosslinks and selected from among linear polyethyleneoxy backbones, and linear polyalkylene backbones each having a molecular weight of from about 10,000 to about 150,000 Daltons, and n is a number from 10 to 4000.

18. A polymeric colorant having the formula



wherein R_1 is hydrogen, R_2 is selected from hydrogen, halos of atomic number 9 through 53 inclusive, lower alkoxies and alkyls of 1 to 3 carbon atoms, nitro, and sulfonate, R_3 is selected from hydrogen and a lower alkyl of from 1 to 3 carbon atoms and R_6 is selected from hydrogen, acetyl sulfonate, n equals 10 to 4000 and m equals 0.3 to 5 n.

27. A polymeric colorant having the formula



wherein R_1 and R_2 are independently selected from among hydrogens, halos of atomic number 9 through 53 inclusive, lower alkyls and lower alkoxies of from 1 to 3 carbon atoms, nitro and sulfonate; R_3 is selected from hydrogen and 1 to 3

carbon lower alkyls; R_6 is hydrogen or acetyl; M is an alkali metal selected from sodium and potassium; n, m and p are numbers wherein n is from 10 to 2000, m is from 0.3 to 5 times n, and p is 0.3 to 2 times the sum of n+m.

4,182,886

AMINO-SUBSTITUTED HYDROXY-PYRIDONES

Rainer Kitzing, Ingatestone; John G. V. Scott, Little Baddow; Terence C. Webb, Witham, and Graham Evans, Galleywood, all of England, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

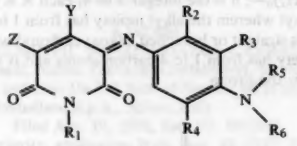
Filed Feb. 21, 1978, Ser. No. 879,425

Claims priority, application United Kingdom, Mar. 3, 1977, 8924/77

Int. Cl.² C07D *213/74, 401/04, 403/04, 413/02*

U.S. Cl. 546—304 **6 Claims**

1. A dyestuff of the general formula



wherein R_1 is hydrogen, alkyl of 1 to 6 carbon atoms, hydroxyalkyl of 1 to 6 carbon atoms, alkoxyalkyl of 1 to 6 carbon atoms each in the alkyl and the alkoxy radical, phenyl, benzyl, β-phenylethyl or cyclohexyl, R_2 is hydrogen, chloro, alkyl, hydroxyalkyl or alkoxy each of 1 to 6 carbon atoms, R_3 is hydrogen, alkyl or alkoxy of 1 to 6 carbon atoms, R_4 is hydrogen or alkyl of 1 to 6 carbon atoms, R_5 and R_6 are hydrogen, alkyl or hydroxyalkyl of 1 to 6 carbon atoms, alkoxyalkyl of 1 to 6 carbon atoms each in the alkyl and the alkoxy radical, carboxyalkyl with 1 to 3 carbon atoms in the alkyl radical, β-methylsulphonamidoethyl or sulpho-n-butyl, R_5 and R_6 and the nitrogen atom to which they are attached are piperidine, morpholine, piperazine or pyrrolidine, Y is hydrogen, alkyl of 1 to 6 carbon atoms, hydroxy, —$COOR_{11}$ or —$COONR_{11}R_{12}$ and Z is —CN, —$COOR_{11}$ or —$CONR_{11}R_{12}$, wherein R_{11} and R_{12} are hydrogen or alkyl of 1 to 3 carbon atoms.

4,182,887

3-AMINO-4-PHENYL-1H-PYRAZOLO[3,4-b]PYRIDINES AND SALTS THEREOF

Josef Roch; Erich Müller; Berthold Narr; Josef Nickl, and Walter Haarmann, all of Biberach, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

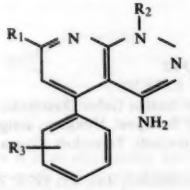
Filed Sep. 19, 1977, Ser. No. 834,114

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643753

Int. Cl.² C07D *471/04*

U.S. Cl. 546—119 **5 Claims**

1. A compound of the formula



wherein

R_1 is pyrrolidino or hexamethyleneimino,

R_2 is hydrogen; and

R_3 is hydrogen, fluorine, chlorine, methyl or methoxy; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,182,888

4-TERTIARY-AMINO-2,6-DIAMINOPYRIDINE 1-OXIDES

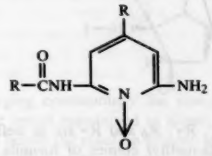
John E. Lawson, and Ronald D. Dennis, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 773,041, Feb. 28, 1977, Pat. No. 4,080,500, which is a division of Ser. No. 638,473, Dec. 8, 1975, Pat. No. 4,021,562. This application Jan. 30, 1978, Ser. No. 873,294

Int. Cl.² C07D *401/12*

U.S. Cl. 546—193 **2 Claims**

1. A compound having Formula III



(III)

wherein R is selected from the group consisting of diethylamino, pyrrolidino, piperidino, morpholino, thiomorpholino, and N-methylpiperazino.

2. The compound of claim 1 which is 4-(1-piperidinyl)-6-[(1-piperidinylcarbonyl)amino]-2-pyridinamine 1-oxide.

4,182,889

PROCESS FOR PREPARING 10-METHYL-2,9-DIOXATRICYCLO[4,3,1,$0^{3,7}$] DECANES

Akiji Asai, Wennigsen; Ivan Ban, Hanover; Samuel David, Hanover, and Peter W. Thies, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

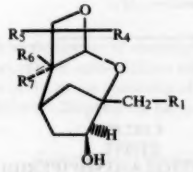
Filed Aug. 22, 1977, Ser. No. 826,636

Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719916

Int. Cl.² C07D *493/08*

U.S. Cl. 546—197 **17 Claims**

1. A process for preparing compounds of formula Ia



(Ia)

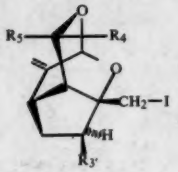
wherein

R_1 represents a tertiary amino group;

one of R_4 and R_5 is hydrogen and the other represents alkyloxy or aralkyloxy; and

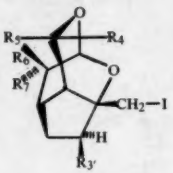
one of R_6 and R_7 is hydrogen and the other represents methyl, which comprises the steps of

(a) catalytically hydrogenating a compound of formula III



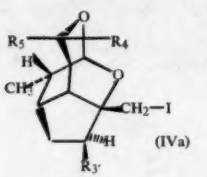
(III)

wherein $R_{3'}$ represents acetoxy and R_4 and R_5 are as defined above by means of hydrogen in the presence of platinum oxide to form a mixture of epimeric compounds of formula IV

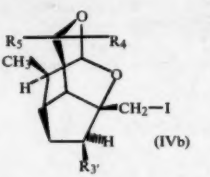


(IV)

wherein $R_{3'}$, $R_{4'}$, $R_{5'}$, R_6 and R_7 are as defined above, comprising a 10α-methyl epimer of formula IVa and a 10β-methyl epimer of-formula IVb



(IVa)



(IVb)

wherein $R_{3'}$, R_4 and R_5 are as defined above;

(b) separating the compounds of formula IVb and IVa from said mixture;

(c) recovering at least one of the compounds of formula IV substantially free from its epimer;

(d) reacting said compound of formula IV with a secondary amine R_1 and subjecting it to ester-hydrolysing conditions, whereby a reaction mixture comprising the compound of formula Ia substantially free from its epimer is obtained; and

(e) recovering the compound of formula Ia from said reaction mixture.

4,182,890

ETHYL 2-OXO-3-PHENYLETHYLAMINOPIPERIDINE-4-CARBOXYLATE HYDROCHLORIDE

George C. Wright, and Ronald E. White, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Dec. 7, 1978, Ser. No. 967,365
Int. Cl.[2] C07D *211/76*
U.S. Cl. 546—221 1 Claim

1. The compound ethyl 2-oxo-3-phenylethylaminopiperidine-4-carboxylate hydrochloride.

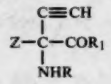
4,182,891

α-ACETYLENIC DERIVATIVES OF α-AMINO ACIDS

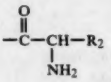
Brian W. Metcalf, Strasbourg, and Michel Jung, Illkirch Graffenstaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Jul. 1, 1977, Ser. No. 812,067
Int. Cl.[2] C07D *211/72, 223/10;* C07C *101/24*
U.S. Cl. 546—243 8 Claims

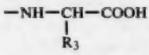
1. A compound of the formula



wherein Z is β-methylthioethyl, β-benzylthioethyl, S-(5'-desoxyadenosin-5'-yl)-S-methylthioethyl, γ-guanidinopropyl, or $RHN(CH_2)_n$—; n is the integer 3 or 4; each R is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, alkoxycarbonyl wherein the alkoxy moiety has from 1 to 4 carbon atoms and is straight or branched, or the group



wherein R_2 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; and R_1 is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, $—NR_4R_5$ wherein each R_4 and R_5 is hydrogen or a lower alkyl group of from 1 to 4 carbon atoms, or the group



wherein R_3 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; with the provisos that when Z is β-benzylthioethyl or S-(5'-desoxyadenosin-5'-yl)-S-methylthioethyl, R is hydrogen and R_1 is hydroxy, when Z is γ-guanidinopropyl, R is hydrogen and R_1 is hydroxy or a straight or branched lower alkoxy group of from 1 to 8 carbon atoms, and when Z is $RHN(CH_2)_n$—both R groups are the same; and the ·lactams thereof when Z is $RHN(CH_2)_n$—and R is hydrogen; and pharmaceutically acceptable salts and individual optical isomers thereof.

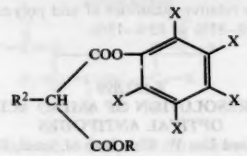
4,182,892

MALONIC ESTERS

Magda Huhn; Eva Somfai; Gabor Szabo; Gabor Resofszki, and Livia Gneth nee Zalantai, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt, Budapest, Hungary

Continuation-in-part of Ser. No. 698,063, Jun. 21, 1976. This application Feb. 24, 1978, Ser. No. 881,008
Claims priority, application Hungary, Jun. 20, 1975, CI 1592
Int. Cl.[2] C07D *213/02, 307/34, 333/02*
U.S. Cl. 549—79 6 Claims

1. A compound of the formula



wherein

R is C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_3 to C_8 cycloalkyl, phenyl, halophenyl, naphthyl, benzyl, indanyl, phenacyl, p-nitrophenacyl, xylyl or acetoxymethyl;

R^2 is thienyl, furyl, furylmethyl or pyridyl unsubstituted or substituted by halo, nitro, dialkylamino, alkoxy or trifluoromethyl; and

X is halo.

4,182,893

ANTHELMINTIC BENZIMIDAZOL-CARBAMATES

Paolo Piccardi, Milan; Giovanni Confalonieri, Monza; Pier G. Ramella, and Lino Da Col, both of Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

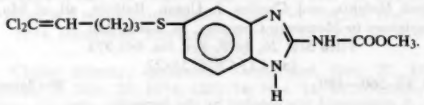
Filed Apr. 19, 1978, Ser. No. 897,853

Claims priority, application Italy, Apr. 20, 1977, 22645 A/77

Int. Cl.[2] A61K *31/415;* C07D *235/32*

U.S. Cl. 424—273 B **3 Claims**

1. Benzimidazol-(2)-methylcarbamate substituted in 5(6) position by the radical $—S—(CH_2)_3—CH=CCl_2$ and having the formula:



3. The method of combatting helmintic infections in animals which consists in administering to the animals an effective amount of an anthelmintic composition the essential anthelmintic constituent of which is the benzimidazol-(2)-methylcarbamate of claim 1.

4,182,894

CONTINUOUS PROCESS FOR THE PREPARATION OF IMIDAZOLINE COMPOUNDS

Akio Miyamura, Funabashi; Yukio Kusumi, Chiba, and Naoichi Omoto, Tokyo, all of Japan, assignors to The Lion Fat and Oil Co., Ltd., Tokyo, Japan

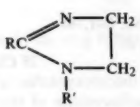
Filed Feb. 22, 1978, Ser. No. 879,931

Claims priority, application Japan, Mar. 8, 1977, 52-25219

Int. Cl.[2] C07F *233/14*

U.S. Cl. 548—352 **4 Claims**

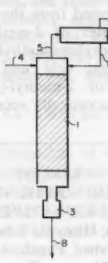
1. A method for the preparation of an imidazoline compound represented by the general formula



where R is an alkyl group having at least 8 carbon atoms and R′ is an alkylol group having 2 to 4 carbon atoms, which comprises the steps of

(a) supplying continuously, either separately or as a mixture, a fatty acid represented by the general formula RCOOH and an N-substituted ethylenediamine represented by the general formula $H_2N—CH_2CH_2—NHR'$, where R and R′ have the same meaning as defined above, into the upper part of a reaction column kept at a temperature in the range from 180° to 250° C. under a pressure of 40 to 70 mmHg,

(b) removing the water formed in the reaction column by the condensation reaction of the N-substituted ethylenediamine and the fatty acid with simultaneous refluxing of the N-substituted ethylenediamine with a reflux condenser cooled to about 40° to 80° C., and



(c) discharging continuously the reaction mixture from a reservoir vessel maintained at about 180° to 250° C. and installed below the reaction column at such a rate that the residence time of the reaction mixture in the reaction column is at least 10 minutes and the residence time of the reaction mixture in the reservoir vessel is at least about 30 minutes.

4,182,895

1-AMINO-LOWER-ALKYL-3,4-DIPHENYL-1H-PYRAZOLES

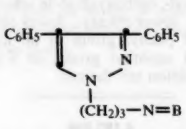
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 752,316, Dec. 20, 1976, abandoned. This application Jul. 14, 1978, Ser. No. 924,677

Int. Cl.[2] C07D *231/12*

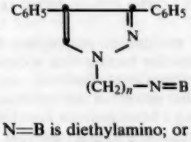
U.S. Cl. 548—378 **7 Claims**

1. A member of the group consisting of (A) a 1-[3-(N=B)-propyl]-3,4-diphenyl-1H-pyrazole having the formula:



where N=B is methylamino or dimethylamino; and (B) pharmaceutically acceptable acid-addition salts thereof.

2. A member of the group consisting of (A) a 1-[(N=B)-lower-alkyl]-3,4-diphenyl-1H-pyrazole having the formula:



where n is 2 and N=B is diethylamino; or n is 3 and N=B is amino or diethylamino; and (B) pharmaceutically acceptable acid-addition salts thereof.

4,182,896

INDANE DERIVATIVES

Jean-Marie Teulon, La Celle Saint-Cloud, France, assignor to Societe Hexachimie, France

Division of Ser. No. 690,391, May 27, 1976, Pat. No. 4,069,326, which is a division of Ser. No. 546,095, Jan. 31, 1975, abandoned. This application Apr. 15, 1977, Ser. No. 788,033

Claims priority, application United Kingdom, Feb. 7, 1974, 5726/74; Aug. 23, 1974, 37220/74; Dec. 16, 1974, 54292/74

Int. Cl.[2] C07C *69/76;* A61K *31/235*

U.S. Cl. 560—8 4 Claims

1. A compound selected from the group consisting of the dimethylaminoethyl ester of 2-methyl-[2-isopropyl-indanyl-(5)]-acetic acid, the diethylaminoethyl ester of 2-methyl-[2-isopropyl-indanyl-(5)]-acetic acid and the dimethylamino-α-dimethyl-ethyl ester of 2-methyl-[2-isopropyl-indanyl-(5)]-acetic acid or a pharmaceutically acceptable acid addition salt of said compound.

4,182,897

AMINO- OR GUANIDINO-PHENYLPROPIONIC ACID DERIVATIVES

Setsuro Fujii, Toyonaka; Hiroyuki Kawamura; Seizo Taira, both of Ichikawa; Ryoji Matsui, Funabashi; Yojiro Sakurai, Kamakura, and Toshiyuki Okutome, Tokyo, all of Japan, assignors to Torii & Co., Ltd., Tokyo, Japan

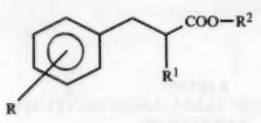
Filed Jun. 20, 1978, Ser. No. 917,232

Claims priority, application Japan, Jun. 24, 1977, 52-75063; Jun. 24, 1977, 52-75064; Apr. 14, 1978, 53-44078; Apr. 14, 1978, 53-44079

Int. Cl.[2] A61K *31/24;* C07C *101/447, 129/12*

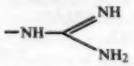
U.S. Cl. 560—19 30 Claims

1. An amino- or guanidino-phenylpropionic ester compound represented by formula (I):



(I)

wherein R is in meta or para position and is $-NH_2$ or



R^1 is hydrogen or a lower alkyl group; R^2 is an unsubstituted NH_2 or a lower-alkyl-, carboxyalkyl- in which the alkyl group is C_1 or C_2 alkyl, lower-alkoxy-, lower-alkoxycarbonyl- or halogen-substituted phenyl group or an unsubstituted or a halogen-substituted naphthyl group, or a pharmaceutically acceptable acid addition salt thereof.

4,182,898

STABLE AND STORABLE POLYESTER-POLYETHER CO-PREPOLYMERS

Edward J. Fujiwara, and Michelle D. Pate, both of Adrian, Mich., assignors to Anderson Development Company, Adrian, Mich.

Filed Jan. 20, 1978, Ser. No. 871,330

Int. Cl.[2] C07C *125/04;* C08G *18/48*

U.S. Cl. 560—26 7 Claims

1. A stable and storable co-prepolymer liquid at normal temperatures, suitable for casting with a curing agent to provide a cast polyurethane resin elastomer, said co-prepolymer having ester and ether groups in the backbone of the polymer chain and comprising a homogeneous liquid which is the reaction product of an organic polyisocyanate, at least one polyester polyol and at least one polyether polyol, the ratio of NCO to OH in the reaction mixture being about 1.5:1 to about 2:1, said polyether polyol being compatible with said polyester polyol, and the relative quantities of said polyester and polyether being 15%–85% to 85%–15%.

4,182,899

OPTICAL RESOLUTION OF AMINO ACIDS INTO OPTICAL ANTIPODES

Yung B. Chae, and Dae W. Kim, both of Seoul, Rep. of Korea, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

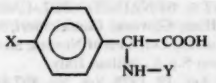
Filed Aug. 7, 1978, Ser. No. 931,529

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1977, 2735834

Int. Cl.[2] C07C *69/02, 101/06*

U.S. Cl. 560—142 3 Claims

1. A salt formed between an optical isomer of 2-aminobutanol and an optical isomer of a compound of the formula



where X is C_1–C_4 alkoxy or C_1–C_4 aliphatic acyloxy and Y is aliphatic acyl.

4,182,900

ETHER DICARBOXYLATES

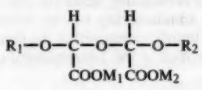
Marvin M. Crutchfield, Creve Coeur; Victor D. Papanu, Maryland Heights, and Charles J. Upton, Ballwin, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 26, 1978, Ser. No. 945,973

Int. Cl.[2] C07C *59/22*

U.S. Cl. 560—180 10 Claims

1. A compound represented by the formula:



where R_1 and R_2 are individually selected from the group consisting of alkyl containing up to about 20 carbon atoms, and M_1 and M_2 are individually selected from the group consisting of hydrogen, alkali metal, ammonium, alkanol amine containing up to about 4 carbon atoms, and alkyl containing up to about 4 carbon atoms.

4,182,901

DIACYLOXYBUTENE ISOMERIZATION WITH SELENIUM DIOXIDE

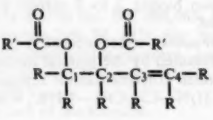
George B. Fozzard, and John R. Norell, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 13, 1977, Ser. No. 841,780

Int. Cl.[2] C07C *67/28*

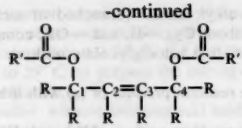
U.S. Cl. 560—262 28 Claims

1. A process for the isomerization of diacyloxyolefins which comprises contacting at least one diacyloxyolefin of the formula



(I)

-continued



(II)

wherein each R is individually selected from the group consisting of hydrogen or an alkyl radical of from 1 to 4 carbon atoms, and wherein R′ can be R or an aryl radical of from 6 to 10 carbon atoms, and wherein at least one of the R's attached to the carbon atoms numbered 1 and 4 in said formulas I and II is hydrogen with a catalyst system formed by admixing selenium dioxide and a carboxlyic acid represented by the general formula

wherein R′ is selected from the group consisting of hydrogen, an alkyl radical of from 1–4 carbon atoms, and an aryl radical of from 6–10 carbon atoms at a pressure sufficient to maintain the system in the liquid phase.

4,182,902

NOVEL CHOLESTEROL-LOWERING COMPOUNDS

Kurt Thiele, Zofingen; Quazi Armed, Strengelbach; Rudolf Adrian, Vordemwald, and Ulrich Jahn, Zofingen, all of Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

Division of Ser. No. 773,144, Mar. 1, 1977, Pat. No. 4,153,803, which is a continuation-in-part of Ser. No. 536,120, Dec. 24, 1974, abandoned. This application Sep. 13, 1978, Ser. No. 942,129

Claims priority, application Switzerland, Dec. 27, 1973, 18144/73; Mar. 28, 1974, 4355/74; Nov. 18, 1974, 15329/74; Nov. 18, 1974, 15330/74

Int. Cl.[2] **C07C** *63/33*

U.S. Cl. 562—468 **1 Claim**

1. p-(p′-chlorobenzyl) phenoxyacetic acid.

4,182,903

13-AZAPROSTAGLANDINS

Duccio Favara, Como, and Umberto Guzzi, Milan, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

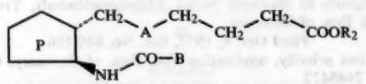
Filed Feb. 2, 1977, Ser. No. 765,039

Claims priority, application United Kingdom, Feb. 23, 1976, 07043/76

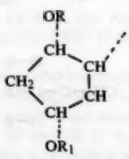
Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 562—503 **1 Claim**

1. A compound of the formula



wherein the ring P has the structure



, the symbol A represents the group cis—CH=CH—, R, R_1 and R_2 represent hydrogen, B represents the group —W—R_3 wherein W represents the group —CHOH— and R_3 represents n-pentyl.

4,182,904

METHOD OF RACEMIZING OPTICALLY ACTIVE N-ACYL AMINO ACIDS IN AQUEOUS SOLUTION

Giselher Franzmann, Witten, and Hans-Leo Hulsmann, Wetter, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Aug. 22, 1978, Ser. No. 935,835

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1977, 2740380

Int. Cl.[2] **C07B** *20/00*

U.S. Cl. 562—401 **9 Claims**

1. Method for the racemization of optically active N-acyl amino acids in aqueous solution, which comprises reacting an aqueous solution of an alkali metal salt of an optically active N-acyl amino acid with ketene at a temperature between 0° C. and the boiling point of the solution.

4,182,905

CHEMICAL COMPOUNDS

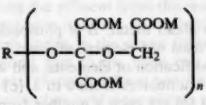
Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 670,336, Mar. 25, 1976, Pat. No. 4,118,420, which is a continuation of Ser. No. 471,088, May 17, 1974, abandoned. This application Sep. 2, 1977, Ser. No. 830,252

Int. Cl.[2] **C07C** *65/02*

U.S. Cl. 562—471 **23 Claims**

1. A compound corresponding to the following formula



wherein M is alkali metal or ammonium and acids and esters thereof, and wherein n is a number from 1 through 3, and wherein R is an aryl radical having at least 6 carbon atoms, a substituted aryl radical having at least 6 carbon atoms wherein the substituents are halogen, nitro, amide or carboxyalkyl substituents, aralkyl radicals having at least 7 carbon atoms or alkoxyaryl or arylpoly (alkyleneoxide) alkylene radicals having at least 7 carbon atoms.

4,182,906

RACEMIZATION OF OPTICALLY ACTIVE 2,2-DIMETHYL-3-(1′-ALKENYL)-CYCLOPROPANE-1-CARBOXYLIC ACIDS

Gohu Suzukamo, Ibaraki, and Tsuneyuki Nagase, Takatsuki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 19, 1977, Ser. No. 798,473

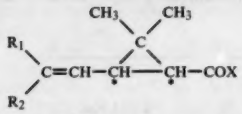
Claims priority, application Japan, May 24, 1976, 51-60288

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.[2] **C07C** *51/00*

U.S. Cl. 562—506 **15 Claims**

1. A method for the racemization of an optically active 2,2-dimethyl-3-(1′-alkenyl)-cyclopropane-1-carboxylic acid halide of the formula:



wherein R_1 and R_2 are each a hydrogen atom or an alkyl group having 1 to 4 carbon atoms or, when taken together with the carbon atom to which they are attached, represent a cycloalkylidene group having 4 to 6 carbon atoms and X is a halogen atom, which comprises contacting the acid halide with a boron halide as a catalyst at a temperature of 10° C. or less to permit the racemization to proceed until a trans-rich racemic mixture is obtained.

4,182,907

PROCESS FOR THE OXIDATION OF OLEFINS TO ALDEHYDES AND ACIDS

Robert K. Grasselli, Garfield Heights; Arthur F. Miller, Cleveland, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Continuation of Ser. No. 676,039, Apr. 12, 1976, abandoned, which is a continuation of Ser. No. 112,782, Feb. 4, 1971, abandoned. This application May 26, 1977, Ser. No. 800,971

Int. Cl.[2] C07C *45/04, 51/32, 57/04*

U.S. Cl. 562—546 **12 Claims**

1. The process for the conversion of an olefin selected from the group consisting of propylene, isobutylene and mixtures thereof, to the corresponding unsaturated aldehydes and unsaturated carboxylic acids, comprising reacting in the vapor phase at a temperature of from about 500° to 900° F. and at a pressure of from about 0.5 to 5 atmospheres said olefin with a molecular oxygen-containing gas in the presence of a catalyst of the empirical formula:

$$A_aB_bC_cFe_dBi_eMo_fO_x$$

wherein A is an alkali metal, B is phosphorus or arsenic or both, and C is at least one element selected from Group IIB of the Periodic Classification of elements, and wherein (a) is 0 to less than 0.1, (b) is a number from 0 to 3, (c) is a number from 0.1 to 10, (d) and (e) are each a number from 0.1 to 6, (f) is a number from 8 to 16, and (x) is a number determined by the valence requirements of the other elements present.

4,182,908

METHODS FOR MAKING KETAL POLYCARBOXYLATE COMPOUNDS

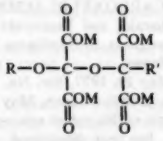
Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 736,962, Oct. 29, 1976, Pat. No. 4,100,358. This application Aug. 15, 1977, Ser. No. 824,458

Int. Cl.[2] C07C *59/23*

U.S. Cl. 562—552 **8 Claims**

1. A method for synthesizing compounds of the molecular structure represented by the formula:



wherein M is selected from the group consisting of —H, $—CH_3$, $—C_2H_5$, $—NH_4$, —Na, —K and combinations thereof; R is selected from the group consisting of an alkyl radical (branched or straight chain) containing up to about C_{20}, $—CH(CO_2M)_2$, and $—CH_2CO_2M$, and R′ is selected from the group consisting of an alkyl radical (branched or straight chain) containing up to about C_{20}, —H, and —OR, comprising

(a) reacting a dialkyl halodiglycolate with an alkali metal alkoxide,

(b) reacting the reaction product of (a) with lithium isopropyl amide,

(c) reacting the reaction product of (b) with CO_2, and

(d) converting the reaction product of (c) alternatively to the

(i) half ester-half acid form by H^+ ion exchange of the Li,

(ii) tetraester form by esterification of the half ester-half acid of (c)(i), or

(iii) tetraalkali metal salt form by hydrolysis of the tetraester form with alkali metal hydroxide.

4,182,909

POLYMERIC CATALYST COMPOSITION FOR HYDROCARBON OXIDATION

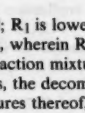
Howard P. Angstadt, Media, Pa., and John P. Bare, Wilmington, Del., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 451,717, Mar. 14, 1974, abandoned, which is a division of Ser. No. 217,945, Jan. 14, 1972, abandoned. This application Dec. 12, 1975, Ser. No. 640,082

Int. Cl.[2] C07C *179/02*

U.S. Cl. 568—574 **11 Claims**

1. In a process for the oxidation of olefins having from 3 to 20 carbon atoms, or organic compounds of the formula



wherein R is lower alkyl; R_1 is lower alkyl or hydrogen; and Ar is naphthyl or phenyl, wherein R and R_1 may be the same or different, to form a reaction mixture comprising the corresponding hydroperoxides, the decomposition products of said hydroperoxides, or mixtures thereof, the improvement which comprises contacting said compounds with air or oxygen at temperatures of from about 80° to 200° C. in the presence of a catalyst comprising a water-stable polymer having a nonmetal-containing backbone, said backbone containing functional groups which are complexed with a metal of any of Group IB to VIIIB, or IIA of the Periodic Table, said polymer being further characterized in being insoluble under the conditions of said process.

4,182,910

METHOD OF PREPARING ORTHOACETIC ACID ALKYL ESTERS

Hans-Georg Schmidt, Niederkassel; Gerhard Daum, and Wilhelm Vogt, both of Cologne, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

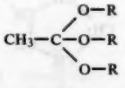
Filed Oct. 6, 1977, Ser. No. 840,186

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2645477

Int. Cl.[2] C07C *43/32*

U.S. Cl. 568—595 **8 Claims**

1. A process for preparing an orthoacetic acid alkyl ester of the formula



wherein R is a saturated, branched or unbranched, alkyl moiety of 1 to 8 carbon atoms which comprises:

(a) contacting acetonitrile with an anhydrous alkanol having

1 to 8 carbon atoms and dry hydrogen chloride in the presence of an inert organic solvent having a dielectric constant measured at 25° C. of 2.6 or less at a temperature of up to 35° C. to prepare the corresponding imidoester hydrochloride;

(b) thereafter, without isolating said imidoester hydrochloride, contacting the reaction mixture of step (a) with an alkanol having 1 to 8 carbon atoms and deacidifying the reaction mixture before raising to 30° C. to less than 40° C. with an alkali metal or alkaline earth metal alcoholate in an amount sufficient to adjust the alkalinity of the reaction mixture so that it is neutral or slightly basic against methyl red, said alcoholate being an alcoholate of the same alcohol employed in step (a);

(c) raising the mixture to a temperature of 30° C. to less than 40° C.; and

(d) removing by-product ammonium chloride from the resultant reaction mixture and distilling the reaction mixture to recover orthoacetic acid alkyl ester.

4,182,911
OPTICALLY-ACTIVE 1-ARYLOXY-2-PROPANOL INTERMEDIATES OF (S)-ABSOLUTE CONFIGURATION

Howard Tucker, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 694,323, Jun. 9, 1976, Pat. No. 4,085,136, Division of Ser. No. 520,845, Nov. 4, 1974, abandoned. This application Dec. 20, 1977, Ser. No. 862,517

Claims priority, application United Kingdom, Nov. 9, 1973, 52077/73

Int. Cl.[2] **C07C** *43/20*

U.S. Cl. 568—633 **6 Claims**

1. An optically-active compound having the (S)— absolute configuration and having the formula:

$$R^1OCH_2.CHOH.CH_2OY$$

wherein R^1 is phenyl, naphthyl, 5,8-dihydronaphthyl, 5,6,7,8-tetrahydronaphthyl, 5,8-ethano-5,6,7,8-tetrahydronaphthyl, indanyl, indenyl, fluorenyl or anthryl, which is unsubstituted or which bears one, two or three substituents selected from halogen, hydroxy and nitro; alkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, cycloalkoxy, alkenyloxy, alkynyloxy, hydroxyalkyl, hydroxyalkenyl and hydroxyalkoxy, each of up to 6 carbon atoms; aryl, aryloxy, aralkyl, aralkoxy, alkoxyalkyl and alkoxyalkoxy, each of up to 10 carbon atoms; and which may also, where there is an appropriate degree of partial saturation, optionally bear an oxo substituent; and wherein Y is α-arylalkyl or tertiary-alkyl.

4,182,912
SYNTHESIS OF 5-BROMOPYROGALLOL 1,3-DIMETHYL ETHER

James W. Foley, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 14, 1978, Ser. No. 942,344

Int. Cl.[2] **C07C** *41/00*

U.S. Cl. 568—649 **11 Claims**

1. A method of preparing 5-bromopyrogallol 1,3-dimethyl ether which comprises reacting equimolar amounts of pyrogallol 1,3-dimethyl ether and N-bromosuccinimide at a temperature between about −70° and 20° C. in a halogenated hydrocarbon solvent containing a monohydric alkanol in an amount sufficient to give said 5-bromopyrogallol 1,3-dimethyl ether as the major reaction product.

4,182,913
METHOD FOR PRODUCING METHYL TERT-BUTYL ETHER AND FUEL COMPOSITION CONTAINING THE SAME

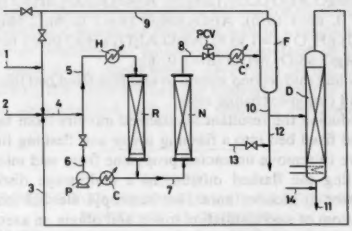
Tetsuya Takezono, Kawasaki, and Yasuo Fujiwara, Tokyo, both of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

Filed Nov. 21, 1977, Ser. No. 853,192

Claims priority, application Japan, Nov. 22, 1976, 51-140479; Nov. 22, 1976, 51-140480; Oct. 14, 1977, 52-123154

Int. Cl.[2] **C07C** *41/00, 41/06*

U.S. Cl. 568—697 **9 Claims**



1. A method for continuously producing methyl tert-butyl ether by reacting methyl alcohol and isobutylene in the presence of an acidic cation exchange resin comprising the steps of (A) allowing isobutylene and methyl alcohol to react with each other by continuously passing an isobutylene-containing hydrocarbon mixture and methyl alcohol through a fixed bed filled with a stongly acidic cation-exchange resin particles of 0.2 to 10 mm in mean grain diameter, at a temperature of 0° to 100° C., a pressure of 1 to 50 atmospheres and a liquid space velocity of 0.1 to 50 (1/hr), the molar ration of isobutylene in said mixture to said methyl alcohol being in the range of 1:0.6 to 1:1.4, (B) dividing the effluent from the reaction of step (A) into first and second parts in which the weight ratio of said first part to said second part is in the range from 1:3 to 1:15; (C) recycling said second part to the fixed bed in step (A); (D) passing said first part through a fixed bed filled with a water-insoluble, solid, particulate acid-neutralizing agent of 0.1 to 10 mm in mean grain diameter, at 0 to 100° C.; (E) introducing the neutralized first part into a flashing tower to flash-remove unreacted hydrocarbon and to recover a methyl tert-butyl ether containing mixture from the bottom of said flashing tower and (F) distilling said methyl tert-butyl ether-containing mixture with a multi-stage distillation column to remove an azeotropic mixture of methyl tert-butyl ether and methyl alcohol from the top of said distillation column and to recycle said azeotropic mixture for reuse in step (A), thereby obtaining methyl tert-butyl ether from the bottom of said distillation column.

4,182,914
PROCESS FOR CONTINUOUSLY PRODUCING DIISOPROPYL ETHER

Masao Imaizumi, Tokyo, Japan, assignor to Nippon Oil Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 689,010, May 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 435,566, Jan. 22, 1974, abandoned. This application Dec. 29, 1977, Ser. No. 865,430

Int. Cl.[2] **C07C** *41/06, 41/10*

U.S. Cl. 568—697 **4 Claims**

1. In a process for continuously producing diisopropyl ether of high purity from isopropyl alcohol and propylene at a high yield, the improvements comprising the steps of:

passing continuously isopropyl alcohol and propylene at a molar ratio of 1:0.5 to 1:3, of isopropyl alcohol to propylene, through a first fixed bed filled with particles of

strongly acidic cation-exchange resin having a mean grain diameter of 0.5 to 10 mm at a liquid space velocity of 0.2 to 2 (1/hr) at a temperature from over 100° C. to 130° C. at a pressure ranging from 20 to 50 atmospheres to react with each other;

dividing the resultant reaction mixture emerging from said first fixed bed into first and second streams;

passing said first stream through a second fixed bed filled with a water-insoluble, solid, particulate, acid-neutralizing agent having a mean grain diameter of 0.1 to 10 mm, at a temperature ranging from 20° to 130° C., said acid-neutralizing agent being selected from the group consisting of MgO, $MgO.mH_2O$ (m=0 to 0.5), Al_2O_3, hydrotalcite ($6MgO.Al_2O_3.CO_2.12H_2O$), $Al_2O_3.mSiO_2.nH_2O$ (m=0.5 to 3, n=1 to 6), $Al_2O_3.nH_2O$ (n=1 to 6), $2.5MgO.Al_2O_3.nH_2O$ (n=1 to 6), $Na_2O.Al_2O_3.nH_2O$ (n=1 to 6), and $2MgO.6SiO_2.nH_2O$ (n=1 to 6);

recycling said second stream to said first fixed bed filled with said cation-exchange resin;

introducing the resultant neutralized mixture from said second fixed bed into a flashing tower and flashing the mixture to remove unreacted propylene from said mixture;

distilling the flashed mixture in a multi-stage distillation tower to recover unreacted isopropyl alcohol from the bottom of said distillation tower and obtain an azeotropic mixture comprising isopropyl alcohol and diisopropyl ether from an upper portion of said distillation tower;

bringing said azeotropic mixture comprising isopropyl alcohol and diisopropyl ether into contact with a solvent selected from the group consisting of hydrocarbons, water and lower alcohols having from 1 to 4 carbon atoms, thereby separating said azeotropic mixture into a layer of isopropyl alcohol and a layer of diisopropyl ether, said layer of isopropyl alcohol containing said solvent when said solvent is water or the lower alcohol, and said layer of diisopropyl ether containing said solvent when said solvent is hydrocarbons;

separating said layers; and

distilling said layer of diisopropyl ether, whereby diisopropyl ether of high purity is obtained.

4,182,915

PREPARATION OF SUBSTITUTED AROMATIC COMPOUNDS

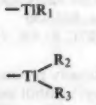
Robert J. Harvey, Teaneck, N.J., assignor to Halcon International, Inc., New York, N.Y.

Filed Jan. 24, 1977, Ser. No. 762,068

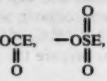
Int. Cl.² C07C *39/02, 39/12;* C07D *307/00*

U.S. Cl. 568—716 **16 Claims**

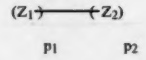
1. A process for the preparation of a nucleophilically ring-substituted aromatic compound, wherein the nucleophilic substituent comprises hydroxy, which comprises reacting, in a liquid medium at a temperature of from about 20° to 500° C., a source of the hydroxy nucleophilic substituent with an aromatic thallium (III) metallate comprising an aromatic compound containing at least one aromatic ring on which is substituted a thallic group having the formula



wherein R_1 is $—CO_3$ or $—SO_4$, and R_2 and R_3 are the same or different and are selected from the group consisting of



$—NO_3$ and halide, wherein E is a member selected from the group consisting of alkyl of from 1 to 12 carbon atoms, cycloalkyl of from 3 to 12 carbon atoms, alkaryl and aralkyl of from 7 to 20 carbon atoms, mononuclear aryl of 6 to 12 carbon atoms, derivatives of the above hydrocarbyl groups wherein at least one carbon atom is replaced by oxygen, derivatives of the above hydrocarbyl and oxygen-substituted hydrocarbyl groups in which at least one hydrogen atom is replaced by a member selected from the group consisting of $—NO_2$, —OH, and alkoxy of from 1 to 6 carbon atoms, and halogenated derivatives of the foregoing, said aromatic compound comprising a member selected from the group consisting of compounds of the formula



wherein p_1 is an integer of 1 to 3; p_2 is an integer of 0 to 3; Z_1 is a radical selected from the group consisting of phenyl, naphthyl, anthryl, phenanthryl, furyl, indenyl, isoindenyl, benzofuryl, and tetrahydrofuryl; and Z_2 is a radical selected from the group consisting of monovalent alkyl of from 1 to 6 carbon atoms, monovalent cycloalkyl of from 3 to 10 carbon atoms, nitro, hydroxy, phenyl, alkyl-substituted phenyl having a total of from 7 to 12 carbon atoms, alkoxy of from 1 to 6 carbon atoms, alkoxy-substituted alkyl of from 2 to 7 carbon atoms, aryloxy of from 6 to 12 carbon atoms, aralkyl of from 7 to 12 carbon atoms, saturated aliphatic carboxyl of from 1 to 8 carbon atoms, aryl carboxyl of from 8 to 12 carbon atoms, hydroxy-substituted alkyl of from 1 to 6 carbon atoms, alkyl esters of from 2 to 8 carbon atoms, divalent alkyl of from 1 to 12 carbon atoms, halogenated derivatives of the foregoing and halogen, with the proviso that when Z_2 is divalent alkyl, p_1 is 2 and p_2 is 1, to form said nucleophilically ring-substituted aromatic compound, said source of hydroxy nucleophile comprising a member selected from the group consisting of water, alkali metal hydroxide, alkaline earth metal hydroxide, ammonium hydroxide, quaternary ammonium hydroxide, and mixtures thereof.

4,182,916

METHOD FOR THE PRODUCTION OF 6-HYDROXY-1,2,3,4-TETRAHYDRONAPHTHALENE

Lewis J. Baskeyfield, Stoke-on-Trent; John D. Bell, Keyworth; John Townend, Crewe, and Simon D. A. Pollock, Loughborough, all of England, assignors to Fisons Limited, London, England

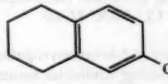
Filed Dec. 27, 1977, Ser. No. 864,256

Claims priority, application United Kingdom, Jan. 7, 1977, 496/77

Int. Cl.² C07C *39/12*

U.S. Cl. 568—734 **15 Claims**

1. A process for the production of 6-hydroxy-1,2,3,4-tetrahydronaphthalene of formula I,



I

which comprises treating beta naphthol with an absorbant selected from silica, alumina and charcoal, at a temperature in the range from 40° C. to the reflux temperature of beta naphthol, removing the absorbant and selectively

hydrogenating the resulting beta naphthol with hydrogen at a pressure of 0–60 atmospheres gauge and a temperature of 40°–140° C., in the presence of a hydrogenation catalyst comprising rhodium, palladium, platinum or ruthenium, the proportion of said catalyst to said beta naphthol being in the range from 0.05:100 to 10:100 by weight.

4,182,917

PROCESS FOR THE PREPARATION OF POLYHYDRIC PHENOLS

Hermann Seifert, Cologne; Helmut Waldmann; Wulf Schwerdtel, both of Leverkusen, and Wolfgang Swodenk, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,622

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658943

Int. Cl.² C07C *39/08*

U.S. Cl. 568—771 **20 Claims**

1. Process for the preparation of pyrocatechol and hydroquinone by the hydroxylation of phenol, which essentially comprises reacting, a solution which contains less than about 5% by weight of water and less than 2% by weight of hydrogen peroxide, and less than 1% by weight of a free strong acid or of a salt of such acid, of a percarboxylic acid having 1 to 18 carbon atoms in an inert, organic solvent, with phenol at temperatures from −10° C. to 80° C.

4,182,918

PROCESS FOR THE PREPARATION OF POLYHYDRIC PHENOLS

Hermann Seifert, Cologne; Helmut Waldmann; Wulf Schwerdtel, both of Leverkusen, and Wolfgang Swodenk, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

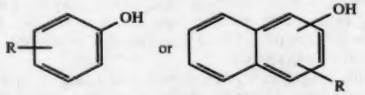
Filed Dec. 5, 1977, Ser. No. 857,623

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658866

Int. Cl.² C07C *39/08*

U.S. Cl. 568—771 **19 Claims**

1. Process for the preparation of a dihydric substituted phenol which essentially comprises reacting, a solution, which contains less than 5% by weight of water less than 2% by weight of hydrogen peroxide, and less than 1% by weight of a free strong acid or of a salt of such acid, of a percarboxylic acid having 1 to 18 carbon atoms in an inert organic solvent with a monohydric substituted phenol of the formula



wherein

R represents C_1–C_{10}-alkyl, C_3–C_{12}-cycloalkyl, phenyl, naphthyl, fluorine, chlorine or bromine, or a nitro, cyano, sulphonic acid, carbohydroxyl, carbo-C_1–C_{10}-alkoxy, C_1–C_3-alkoxy or C_1–C_4-dialkylamino group, said alkyl and cycloalkyl radicals defining R being unsubstituted or substituted by fluorine, chlorine or bromine atoms or C_1–C_5-alkoxy, C_1 to C_4-dialkylamino, carboxyl, nitro, cyano, sulphonic acid or C_1 to C_{10}-carbalkoxy groups, and said phenyl and naphthyl radicals defining R being unsubstituted or substituted by fluorine, chlorine, bromine, C_1–C_{10}-alkyl or C_3–C_{12}-cycloalkyl, as well as nitro, carbohydroxyl, carbo-C_1–C_{10}-alkoxy, C_1–C_5-alkoxy, cyano, sulphonic acid or C_1–C_4-dialkylamino groups at a temperature from about −20° C. to about 120° C.

4,182,919

PROCESS FOR REACTION IN CATALYST SUSPENSION SYSTEM

Shunsuke Mabuchi; Sadakatsu Kumoi, and Kenji Tsuzuki, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Mar. 16, 1978, Ser. No. 887,217

Claims priority, application Japan, Mar. 31, 1977, 52-35234

Int. Cl.² C07C *31/20, 87/00, 59/10, 67/05*

U.S. Cl. 568—861 **13 Claims**

1. A process of reaction in a suspended catalyst system which comprises continuously reacting an organic compound in the presence of a suspended solid catalyst in a liquid phase in a reactor equipped with a filter disposed in the reactor for separating the suspended catalyst in the reactor from the reaction product as it leaves the reactor to pass to a reaction product receiver whereby the reaction and separation of the suspended catalyst are continuously performed in the reactor, backwashing the reactor when the filtering speed is reduced below a predetermined value, and resuming the continuous reaction.

4,182,920

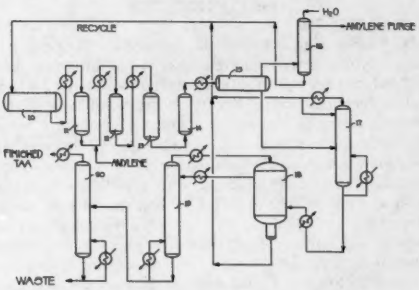
PROCESS FOR HYDRATION OF OLEFINS TO PRODUCE ALCOHOLS

James H. Giles, Lake Jackson; Jeffery H. Stultz, Freeport, and Sandra W. Jones, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 11, 1977, Ser. No. 814,363

Int. Cl.² C07C *29/04*

U.S. Cl. 568—895 **1 Claim**



1. A process for making t-amyl alcohol by reacting 2-methyl butenes, contained in a C_5 hydrocarbon mixture, with water, employing acetone as a solvent, in the presence of the acid form of a cation exchange resin in a three-stage reactor system which comprises,

(1) feeding said C_5 hydrocarbon mixture into the effluent of the first stage reactor which contains water, acetone, recycle 2-methyl butenes, t-amyl alcohol product, unreactive hydrocarbons and by-products as a single phase solution,

(2) passing said mixture as a single phase solution into a second stage reactor and from thence into a third stage reactor,

(3) treating the effluent of said third stage reactor to remove acidic impurities formed in the process by passing said effluent through a bed of anion exchange resin in the base form,

(4) distilling the effluent of said anion exchange resin bed to flash overhead up to about 10 percent by weight of the so-treated effluent to remove a part of the unreactive hydrocarbons contained therein,

(5) condensing and recovering acetone from the flashed overhead portion by contacting with water and returning the acetone and water to the feed to the first stage reactor,

(6) distilling the bottoms from step 4 to recover overhead the acetone along with unreacted 2-methylbutenes,

(7) condensing the acetone and unreacted 2-methylbutenes and returning same to the feed to the first stage reactor,

(8) treating the bottoms from step 6, which contains the product alcohol, water and higher boiling by-products, to phase separate at least part of the water by adding a C_5 hydrocarbon mixture,

(9) separating the alcohol phase and azeotropically distilling to dry the alcohol,

(10) recovering the alcohol from the distillate and returning it to the azeotropic distillation and returning the water to the feed to the first stage reactor,

(11) passing the dry alcohol contained in the bottoms of said azeotropic distillation which contains higher boiling by-products to a distillation column and distilling to recover the pure t-amyl alcohol.

4,182,921

METHOD OF PURIFYING ALKYLPHENOL

Valentina J. Borgardt, ulitsa Imaya Masyri, 1, kv. 193, Bashkirskaya ASSR Sterlitamak; Jury I. Volodin, ulitsa Kalinina, 3, kv. 59, Kuibyshevskaya oblast Novokuibyshevsk; Zoya S. Shalimova, ulitsa Druzhby, 19, kv. 56, Bashkirskaya ASSR Sterlitamak; Boris T. Pantukh, ulitsa khudaiberdina 162, kv. 89, Bashkirskaya ASSR Sterlitamak; Sofya A. Egoricheva, ulitsa Nagumanova 56a, kv. 23, Bashkirskaya ASSR Sterlitamak; Grigory I. Rutman, Revoljutsionnaya ulitsa 7, kv. 6, Bashkirskaya ASSR Sterlitamak, and Jury I. Michurov, prospekt Lenina, 13, kv. 4, Bashkirskaya ASSR Sterlitamak, all of U.S.S.R.

Filed May 12, 1977, Ser. No. 796,302

Int. Cl.[2] C07C *37/24*

U.S. Cl. 568—750 **8 Claims**

1. A continuous crystallization method for purifying a tertiary alkylphenol selected from the group consisting of 4-methyl-2,6-di-tert. butylphenol, bis-(5-methyl-3-tert.butyl 2-hydroxyphenol)methane and 2,4,6-tri-tert.butylphenol from alkylated phenol impurities comprising contacting an impure tertiary alkylphenol with a solvent, inert to the alkylphenol and capable of removing said alkylated phenol impurities in a continuous action crystallizer equipped with a vertical washing element at a rate of 0.12 to 0.31 hr^{-1} and temperature varying from 15° C. to 20° C. to form tertiary alkylphenol crystals; passing said tertiary alkylphenol crystals over the washing element in the form of a layer of crystals moving downward at a rate of 0.1 to 1.0 hr^{-1}; and washing the layer of crystals with a counter-current stream of said solvent, moving upward at a rate of 0.09 to 0.35 hr^{-1}

4,182,922

SYNTHETIC HYDROCARBON LUBRICATING OIL

John W. Schick, Cherry Hill, and Robert M. Gemmill, Jr., Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,598

Int. Cl.[2] C07C *3/20*

U.S. Cl. 585—18 **15 Claims**

1. A lubricating oil comprising a copolymer of ethylene and propylene or a copolymer of ethylene, propylene and a higher 1-olefin having from 4 to 10 carbon atoms, wherein the oil has a pour point of from about −35° F. to < −65° F. and a viscosity index of from about 100 to about 135 and wherein that portion of the copolymer formed from ethylene is from about 2% to about 10% by weight, said oil being made by a method comprising (1) reacting ethylene and propylene in the presence of (a) a vanadium-containing catalyst and (b) an aluminum-containing catalyst and (2) reacting the step (1) product with propylene or mixed propylene-higher 1-olefin in the presence of a Friedel-Crafts catalyst.

4,182,923

DISPROPORTIONATION OF TOLUENE

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 24, 1978, Ser. No. 881,109

The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.

Int. Cl.[2] C07C *3/62*

U.S. Cl. 585—475 **13 Claims**

1. A process for effecting disproportionation of toluene with high conversion thereof to produce benzene and xylenes in which the proportion of para-xylene is in excess of its normal equilibrium concentration which comprises contacting toluene under conditions effective for accomplishing said disproportionation in the presence of a catalyst comprising a crystalline aluminosilicate zeolite, said zeolite having a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12, said catalyst having enhanced activity as a result of prior modification by treatment with an ammonium hydrogen phosphate to deposit at least about 0.5 weight percent of phosphorus thereon.

4,182,924

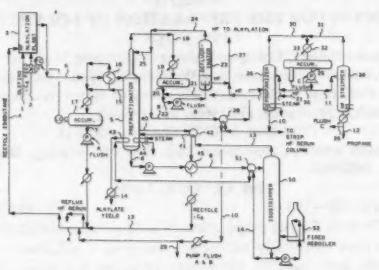
HF ALKYLATION PROCESS UTILIZING FRACTIONATION ZONES AT DIFFERENT PRESSURES AND INCLUDING INDIRECT HEAT EXCHANGE

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 12, 1978, Ser. No. 914,823

Int. Cl.[2] C07C *3/54*

U.S. Cl. 585—712 **5 Claims**



1. A process for the separation of the hydrocarbon liquid phase recovered from the effluent of an HF alkylation in a fractionation system employing low pressures in an initial fractionation followed by high pressures in subsequent fractionations which comprises:

(a) passing said hydrocarbon liquid phase comprising alkylate, unreacted paraffin, propane, and small amounts of HF to a first fractionation zone operated at pressures in the range 100–150 psia,

(b) subjecting said hydrocarbon liquid phase in said first fractionation zone to fractionation conditions sufficient to remove (1) an overhead stream comprising propane and lighter materials including trace amounts of HF and some isoparaffin, (2) a side vapor stream comprising isoparaffin, and (3) a bottoms stream substantially free of HF comprising isoparaffin and alkylate;

(c) condensing said overhead (1) and passing condensate formed to a second fractionation zone operated at a higher pressure than said pressures in said first fractionation zone under fractionation conditions sufficient to separate a second overhead stream comprising propane and a second bottoms stream comprising isoparaffin, and recycling said isoparaffin to said HF alkylation;

(d) passing said bottoms stream (3) to a third fractionation zone operated at a higher pressure than said pressures in said first fractionation zone and therein subjecting same to fractionation conditions sufficient to remove a third over-

head stream comprising isoparaffin vapors and to recover a third bottoms stream comprising alkylate;

(e) passing said third overhead stream obtained in (d) in indirect heat exchange with a lower portion of said first fractionation zone and recycling said stream after said heat exchange to said alkylation; and

(f) passing said third bottoms in (d) in indirect heat exchange with said bottoms stream (3) to said third fractionation zone and in indirect heat exchange with the lower portion of said first fractionation zone prior to recovery of said third bottoms in step (d) as alkylate product.

4,182,925

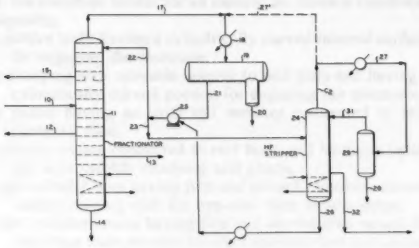
ALKYLATION EFFLUENT RECOVERY SYSTEM

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 426,674, Dec. 12, 1973, Published as B 426,674 on Jan. 28, 1975, under the First Trial Voluntary Protest Program, abandoned. This application Sep. 15, 1975, Ser. No. 613,667

Int. Cl.[2] C07C *3/54*

U.S. Cl. 585—719 **10 Claims**



1. In the alkylation of an isoparaffin with an olefin wherein the alkylation effluent hydrocarbon phase is fractionated to remove alkylate, normal butane, isobutane, ethane and lighter, and HF acid therefrom, wherein the overhead hydrocarbon fraction containing propane, ethane, lighter hydrocarbons and HF acid is condensed and allowed to separate into phases in the fractionator overhead accumulator and said HF acid is removed while the condensed hydrocarbon phase is in part returned as reflux to said fractionator and in part is passed to an HF stripper, the improvement which comprises removing ethane and propane as a side draw stream from said HF stripper, thus obtaining a bottoms of liquid propane from the HF stripper, substantially free from HF, suitable for use wherever a hydrocarbon stream free from HF is needed.

4. In the alkylation of an isoparaffin with an olefin wherein the alkylation effluent hydrocarbon phase is fractionated to remove alkylate, normal butane, isobutane, propane, and HF acid therefrom, wherein the overhead hydrocarbon fraction containing propane, isobutane and some normal butane and HF acid is condensed and allowed to separate into phases in the fractionator overhead accumulator and said HF acid is removed while the condensed hydrocarbon phase is in part passed to an HF stripper, the improvement which comprises removing propane and isobutane as a side draw stream from said HF stripper, thus obtaining a bottoms of liquid isobutane from the HF stripper, substantially free from HF, suitable for use wherever a hydrocarbon stream free from HF is needed.

4,182,926

CATALYTIC PROCESS FOR OBTAINING METHANE FROM METHANOL

David D. Saperstein, Mountainside, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 21, 1978, Ser. No. 944,502

Int. Cl.[2] C07C *1/20*

U.S. Cl. 585—733 **6 Claims**

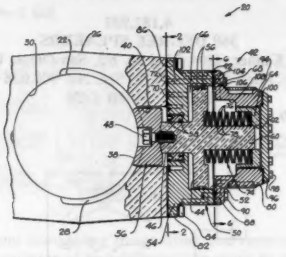
1. A process for producing methane comprising passing a gas stream comprising methanol at a temperature of at least 200° C. into contact with a cobalt molybdate catalyst heated to at least 200° C. for a contact time of at least 0.01 second; separating the methane from any residue of unreacted methanol.

4,182,927

ELECTRODE HOLDERS HAVING DIFFERENTIAL CLAMPING DEVICES

Donald L. Phillips, Birmingham, Ala., assignor to Dixie Bronze Company, Birmingham, Ala.

Filed Aug. 4, 1978, Ser. No. 930,976
Int. Cl.[2] H05B 7/102
U.S. Cl. 13—16 **21 Claims**



1. An electrode holder for an electric arc furnace electrode, comprising

a holder body having a cylindrically curved internal surface for engaging the electrode,

a clamping shoe movable relative to said body and having a cylindrically curved portion for engaging the electrode,

a piston having an axial rod member connected to said clamping shoe,

cylinder means connected to said body and having a cylinder bore slidably receiving said piston,

said cylinder bore having first and second chambers therein communicating with the opposite sides of said piston,

said cylinder means having first and second port means for admitting fluid pressure to said respective first and second chambers,

an axial guide shaft member on said piston and extending therefrom in a direction opposite from the direction of said rod member,

said cylinder means having a guide opening therein slidably receiving and guiding said guide shaft member,

and compression spring means mounted around said guide shaft member and compressed between said piston and said cylinder means for exerting a resilient biasing force on said piston for biasing said clamping shoe into clamping engagement with the electrode,

said clamping engagement being released by fluid pressure supplied to said first chamber to move said piston in opposition to said spring means,

the clamping force exerted by said clamping shoe being increased by fluid pressure supplied to said second chamber for exerting force on said piston to supplement the resilient force of said spring means.

4,182,928

HEATING ELEMENT TERMINAL

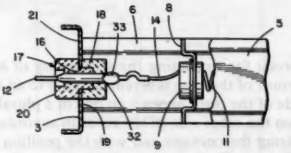
James E. Murphy, Mesquite; Felix M. Atwood, Richardson, and Harold D. McDonald, Mesquite, all of Tex., assignors to Square D Company, Palatine, Ill.

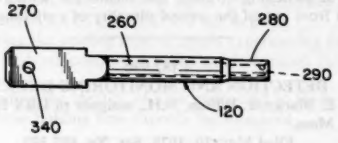
Continuation of Ser. No. 672,372, Mar. 31, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 886,708
Int. Cl.[2] H01B 17/26; H05B 3/06
U.S. Cl. 174—153 R **1 Claim**

1. An electric terminal assembly comprising:

an integrally formed conductive element having a tubular segment and a flat plate at one end thereof, a central bore in said tubular segment being open at the end opposite said flat plate, said tubular segment including an intermediate tubular portion and an end tubular portion for attachment to an electrical conductor, the diameter of said end tubular portion being smaller than that of said intermediate tubular portion, said flat plate being integrally joined to said intermediate tubular portion opposite said end tubular portion, the width of said flat plate being greater than the outer diameter of said intermediate tubular portion;

a two-piece matable insulating assembly, having a central bore for containing said tubular segment, said two-piece matable insulating assembly being in mounting association with a panel member having a predetermined opening, said panel member being clamped between said two-piece matable insulating assembly, said two-piece matable insulating assembly comprising first and second ceramic disks having central bores therethrough, said first disk including a projecting member extending from a clamping side thereof coaxially surrounding said central bore, said second disk including a corresponding recess opening in a clamping side thereof receiving said projecting member therein, said central bore of said two-piece matable insulating assembly providing an insulated passageway through said opening in said panel, the diameter of said insulated passageway being slightly greater than the outer diameter of said intermediate tubular portion of said tubular segment for a snug sliding fit; and





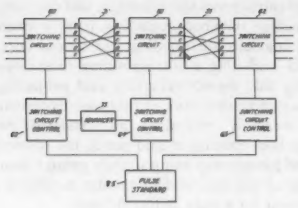
wherein said tubular segment is slidingly received in said central bore of said two-piece matable insulating assembly with said end tubular portion projecting from a first end of said two-piece matable insulating assembly, said flat plate projecting from a second end of said two-piece matable insulating assembly with an edge region of said flat plate abutting against a portion of said two-piece matable insulating assembly adjacent said central bore of said two-piece matable insulating assembly, and also wherein an electrical conductor extends into said end tubular portion and said end tubular portion is deformed about said electrical conductor to cause the width of said end tubular portion to increase and be greater than said diameter of said insulated passageway whereby said deformed portion of said end tubular portion provides an abutment against said two-piece matable insulating assembly at said first end while said flat plate provides an abutment against said two-piece matable insulating assembly at said second end thereby holding said two-piece matable insulating assembly together with said panel member clamped between without exerting compressive force against said first and second ends.

4,182,929

CIRCUIT FOR SIMULATING THE SCRAMBLING OF AN ELECTROMECHANICAL ROTOR

Lawrence D. Prehn, Madison St., Gillette, N.J. 07933

Filed May 2, 1957, Ser. No. 656,731
Int. Cl.[2] H04L 1/00
U.S. Cl. 178—22 **8 Claims**



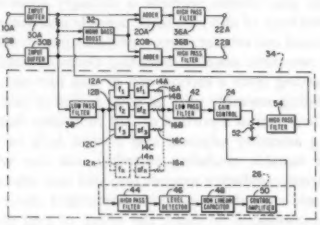
1. A circuit for simulating the scrambling of an electromechanical rotor of the type wherein an input to an input contact on one side of the rotor appears on one of a plurality of output contacts on the other side of the rotor in accordance with the wiring among the contacts and with the position of the rotor, which comprises first and second pluralities of switching circuits, means connecting the two pluralities of switching circuits in a manner dictated by the wiring between the input and output contacts of the rotor being simulated, means for applying an input to the first plurality of switching circuits, means for energizing a predetermined switching circuit in each plurality of switching circuits, and means for withdrawing an output from one of the second plurality of switching circuits.

4,182,930

DETECTION AND MONITORING DEVICE

David E. Blackmer, Wilton, N.H., assignor to DBX Inc., Newton, Mass.

Filed Mar. 10, 1978, Ser. No. 885,393
Int. Cl.[2] H04R 3/00, 5/04
U.S. Cl. 179—1 R **16 Claims**



1. Apparatus for synthesizing from an audio signal, an enhanced audio signal, said apparatus comprising, in combination:

means for sensing signal energy of said audio signal within a preselected frequency portion of said audio signal and for dividing said sensed signal energy into a plurality of discrete bands according to the frequency thereof;

means, responsive to the signal energy in each of said bands, for generating a like plurality of second signals each of which includes frequency componenets which are subharmonics of the frequencies of the corresponding frequency band;

means for combining said plurality of second signals so as to provide a combined signal; and

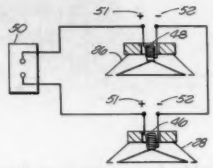
means for adding said combined signal to said audio signal to provide said enhanced audio signal.

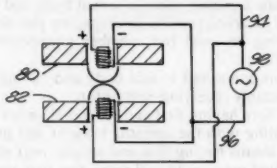
4,182,931

360 DEGREE SPEAKERS

Samuel K. Kenner, 4104 52nd St. #3, San Diego, Calif. 92105

Filed Apr. 25, 1978, Ser. No. 900,036
Int. Cl.[2] H04R 1/26
U.S. Cl. 179—1 E **3 Claims**





1. An audio speaker set comprising: a bass unit comprising:

a casing having a first wall and a second wall, a first aperture through said first wall and a second aperture through said second wall;

a first bass speaker in said casing having concave front and convex rear sound propagating surfaces, said first speaker making sealing contact with said casing first aperture and mounted so that said front surface faces outwardly of said casing;

a second bass speaker acoustically coupled to said first bass speaker having concave front and convex rear sound propagating surfaces, said second speaker making sealing contact with said casing second aperture and mounted so that said front surface faces inwardly of said casing, said casing, first speaker and second speaker forming a substantially air-tight chamber; and

means for operating said speakers 180 degrees out of phase with each other so that said speaker surfaces in reactive contact with air within said air chamber alternately compress and rarefy said chamber air;

a high frequency unit comprising:

a first dome-type speaker having a forward surface for alternately compressing and rarefying air;

a second dome-type speaker having a forward surface, facing the forward surface of said first dome-type speaker, for alternately compressing and rarefying air, said second speaker forward surface being positioned from touching said first speaker forward surface to less than two inches therefrom;

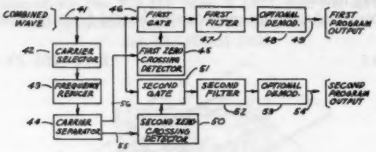
means for operating said first and second dome-type speakers substantially in phase with each other; and

means for mounting said bass unit and said high frequency unit so that the longitudinal axes of said bass speakers and said dome-type speakers are substantially colinear.

4,182,932
A-M STEREO SYSTEM

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec H3H 1T1, Canada, and Sidney T. Fisher, 53 Morrison Ave., Montreal, Quebec H3P 3C6, Canada

Filed Oct. 26, 1978, Ser. No. 955,154
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—1 GS **6 Claims**

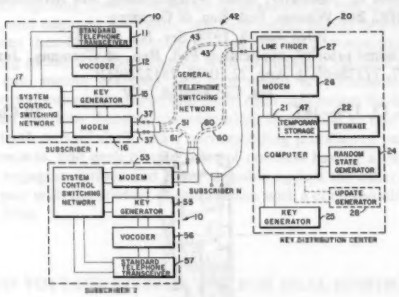


1. A system comprising transmitting and receiving apparatus, for transmission of two different programs by double-sideband amplitude modulation of two different carriers of the same frequency, and phase difference less than 90°, and reception and substantially complete separation of said programs, by sampling the combined wave separately at instants of zero crossings of each of said modulated carriers and by integrating the sample sequences so produced.

4,182,933
SECURE COMMUNICATION SYSTEM WITH REMOTE KEY SETTING

Howard E. Rosenblum, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 14, 1969, Ser. No. 800,371
Int. Cl.[2] H04K *1/00;* **H04L** *9/00*
U.S. Cl. 179—1.5 R **10 Claims**



1. A secure communication system comprising:

a remotely selectable means for selecting a key setting variable and at least one unique variable and transmitting a remotely selected key setting variable, the remotely selectable means including a means for reiteratively replacing the key setting variable when the key setting variable is remotely selected, said replacement of said key setting variable occurring the next successive time that remote selection is initiated;

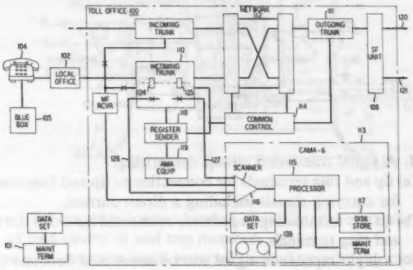
a first means for initiating remote selection, for receiving the transmitted remotely selected key setting variable and for transmitting a secure communication enciphered in accordance with the key setting variable, the first receiving means being unique to said unique variable, said initiation of remote selection occurring each time said first receiving means desires secure communication with another receiving means; and

a second means for initiating remote selection and for receiving communications from the first receiving means, using the key setting variable selected by the remotely selectable means upon initiation by said first receiving means to enable secure communication between said first and second receiving means, said first receiving means receiving a verified reiteratively replaced key setting variable from said remotely selectable means before communication with said second receiving means is accomplished.

4,182,934
METHOD AND APPARATUS FOR DETECTING IRREGULAR TELEPHONE CALLS

Charles T. Keys, Pataskala, and Renald A. Ratti, Westerville, both of Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 26, 1978, Ser. No. 945,810
Int. Cl.[2] H04M *15/12, 1/66*
U.S. Cl. 179—7 R **9 Claims**



1. A method of identifying fraudulent calls in a telephone system wherein a potentially fraudulent call on a trunk is detected by a momentary off-hook signal from the called end of the trunk CHARACTERIZED BY the steps of:

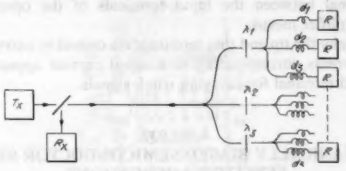
comparing the holding time of trunks experiencing momentary off-hook conditions with a predetermined threshold time, and

recording the identity of lines connected to those trunks whose holding time exceeds the threshold.

4,182,935
OPTICAL FIBER DATA TRANSMISSION SYSTEM

Martin Chown, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,033
Claims priority, application United Kingdom, Dec. 7, 1976, 50962/76
Int. Cl.[2] H04J *3/04, 1/00, 4/00*
U.S. Cl. 179—15 AL **17 Claims**



1. An optical fiber data transmission system comprising:

a plurality of optical sensor devices capable of modulating an interrogatory signal;

first means coupled to said devices for transmitting an optical interrogatory signal to all of said devices;

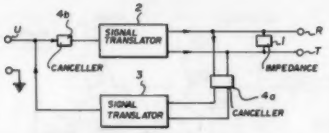
an optical receiver;
a first optical fiber optically coupled at one end to all of said devices and at the other end to said receiver; and
a plurality of second means each coupled to a different one of said devices to discriminate between optical output signals, including said interrogatory signal modulated by sensor information, emitted from said devices in response to said interrogatory signal.

4,182,936

TRANSFORMERLESS TRUNK CIRCUIT

Patrick R. Beirne, Stittsville; Michael C. J. Cowpland, Ottawa, and Raymond J. Whitbread, Ashton, all of Canada, assignors to Mitel Corporation, Canada

Filed Jul. 17, 1978, Ser. No. 925,297
Claims priority, application Canada, Feb. 28, 1978, 297883
Int. Cl.[2] H04M 7/10
U.S. Cl. 179—18 AH **18 Claims**



1. A signal translation circuit comprising:
(a) tip and ring terminals for connection to tip and ring leads, for carrying signals including a direct current,
(b) an a.c. terminating impedance connected between the tip and ring terminals,
(c) a high impedance signal source connected between the tip and ring terminals, having a circuit path for conduction of direct current,
(d) means for controlling the signal source including a first light sensitive solid state device for carrying a signal which is a function of a signal to be transmitted on the tip and ring leads, and for controlling the passage of current through the signal source as a function of the current passing through the light sensitive solid state device so as to apply a desired signal to the tip and ring terminals,
(e) means for connecting a lead pair, including a terminal for carrying trunk signals,
(f) an operational amplifier means having a light emitting means connected in a load circuit therewith and optically coupled to the first light sensitive solid state device, the operational amplifier having its input connected in a signal path to the terminal for carrying trunk signals,
(g) a second light sensitive solid state device optically coupled to the light emitting means having a transfer function with the light emitting means which is similar to the transfer function of the first light sensitive solid state device with the light emitting means, the second light sensitive solid state device being adapted to apply a differential signal between the input terminals of the operational amplifier means,
whereby the tip and ring terminals are caused to carry signal currents corresponding to a signal current appearing at said terminal for carrying trunk signals.

4,182,937

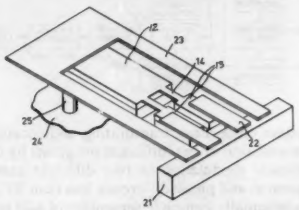
MECHANICALLY BIASED SEMICONDUCTOR STRAIN SENSITIVE MICROPHONE

John C. Greenwood, Harlow, England, assignor to International Standard Electric Corp., New York, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,425
Int. Cl.[2] H04R 17/02, 21/02
U.S. Cl. 179—110 B **6 Claims**

1. A microphone transducer element of the type in which acoustic vibration generates corresponding resistance changes, including:
at least two semiconductor plate members;
an integral flexible laminar semiconductor support upon which said plate members are situated; and
at least one laminar semiconductor filament for interconnecting said plate members such that said at least one filament is strain-sensitive.

5. A microphone assembly comprising:
housing means;
flexible diaphrgam means mounted in said housing means;



semiconductor strain gauge transducer element; first and second contact springs for securing said transducer element to said housing;
spring lever means mounted on said housing proximate to said contact springs for biasing said transducer element into a state of strain; and
fulcrum means mounted on said diaphragm and in abutment with the spring lever means such that acoustic vibrations of the diaphragm are transmitted to said transducer element.

4,182,938

TELEPHONE SUPPORTING SET

Robert G. Neumeier, Häus Nymphenburg, Am Strandbad 8, 8182 Bad Wiessee, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,341
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 7717566[U]; Apr. 22, 1978, 7812289[U]
Int. Cl.[2] H04M 1/21
U.S. Cl. 179—147 **10 Claims**

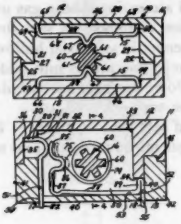
1. A telephone supporting set comprising a base support having a low flat portion supporting a telephone thereon, a raised portion on said base support adjacent to said flat portion, said raised portion having a downwardly and forwardly sloping surface, a recess provided in said sloping surface, said recess having a downwardly and forwardly sloping bottom wall, the top of the sloping bottom wall of said recess having a portion offset from the plane of the sloping bottom wall, a removable component providing a telephone conversational aid supported in said recess, the top portion of said component at the top of the sloping recess extending over and being spaced from said offset portion, whereby the component may be removed from the recess by pressing downwardly on the top edge portion of said component causing the component to

pivot about the junction between the sloping bottom wall of the recess and the offset portion, thereby pivoting the bottom portion of the component upwardly away from the recess in the sloping surface.

4,182,939
MINIATURE SWITCHES

Donavon L. Feaster, New Bedford, Mass., assignor to Sonitronics, Inc., Flushing, N.Y.

Division of Ser. No. 774,318, Mar. 4, 1977, Pat. No. 4,117,280.
This application Mar. 15, 1978, Ser. No. 925,331
Int. Cl.² H01H *3/00*
U.S. Cl. 200—17 R **2 Claims**



1. Improved switch construction comprising: first and second housings, mounting means on said housings, said housings being interconnected to form a unitary hollow casing element having a principal longitudinal axis; an operating extending longitudinally within said casing and having a cross-section defining a plurality of teeth separated by a corresponding plurality of interstices; detent means having at least one resilient projection selectively engageable in the interstices between adjacent teeth on said shaft, whereby said shaft may be incrementally indexed to as many rotational positions as there are teeth; a plurality of rotary cam means, each having an interior opening corresponding in cross-section to that of said shaft, and engaged therewith; said cam means having bearing surfaces thereon, said housing element having corresponding bearing means thereon engaged with the bearing surfaces on said cam means, whereby said cam means are rotationally supported independently of said shaft; each cam means having at least one lobe thereon, corresponding in position to one of said teeth on said shaft; and a corresponding plurality of pairs of contacts, one each of said pairs of contacts having a camlobe engaging surface and being movable against the other of said pair with the contact of said surface with a corresponding cam lobe.

4,182,940
HIGH VOLTAGE DISTRIBUTOR FOR DUAL IGNITION SYSTEM

August J. Scussel, Birmingham; Walter W. Fedison, Jr., Ortonville, and Donald R. Michie, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 29, 1978, Ser. No. 937,694
Int. Cl.² H01H *19/00*; F02P *7/02*
U.S. Cl. 200—19 R **11 Claims**

1. A high voltage distributor for providing simultaneous switching for a dual ignition system comprising:

a base member having a circular internal cavity about a central axis;

a plurality of first conductive contacts equally spaced in a first plane about the periphery of said internal cavity of said base member;

a plurality of first output terminals located on said base member outside said cavity respectively corresponding to said first contacts;

a first common contact located inwardly of the periphery of said cavity of said base member;

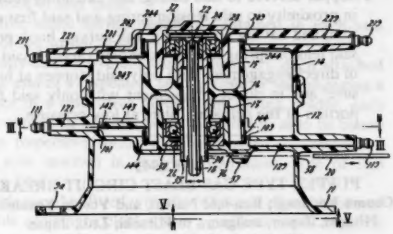
a first common input terminal located on said base member outside said cavity;

first means integral with said base member for respectively electrically connecting said first contacts and said first common contact to said corresponding first terminals and said first common terminal;

a cap member, adapted for mating with said base member, having a circular internal cavity corresponding to said base member cavity, whereby a closed cylinder is defined by the mating of said cap member with said base member;

a plurality of second conductive contacts equally spaced in a second plane about the periphery of said internal cavity of said cap member;

a plurality of second output terminals located on said cap member outside said cavity respectively corresponding to said second contacts;



a second common contact located inwardly of the periphery of said cavity of said cap member;

a second common input terminal located on said cap member outside said cavity;

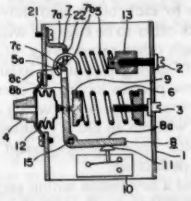
second means integral with said cap member for respectively electrically connecting said second contacts and said second common contact to said corresponding second terminals and said second common terminal; and

rotor means located within said defined cylinder for providing sequential electrical connection between said first common contact and each of said plurality of first contacts and for simultaneously providing sequential electrical connection between said second common contact and each of said plurality of second contacts.

4,182,941
IMPROVED PRESSURE SWITCH

Fuminori Tashiro, Tokorozawa, Japan, assignor to Kabushiki Kaisha Saginomiya Seisakusho, Tokyo, Japan

Filed Apr. 10, 1978, Ser. No. 895,278
Claims priority, application Japan, Aug. 3, 1977, 52/103310[U]
Int. Cl.² H01H *35/32*
U.S. Cl. 200—83 C **5 Claims**



1. A pressure switch comprising a casing having an opening therethrough;

a bellows having an opening adapted for high pressure and low pressure conditions secured to said casing opening at

its open end, and its closed end projecting inside said casing;

a microswitch provided within the casing and having a contact member;

an actuating plate provided inside the casing and pivotable on a fulcrum; said actuating plate including a first arm portion and a second arm portion, said first arm portion abutting against the closed end of said bellows and said second arm portion abutting against said contact member;

a compression spring mounted at one end to said casing and abutting at its other end against the first arm portion of said actuating plate to counteract any inflation of said bellows;

a tension spring extending substantially parallel to said compression spring, and being mounted to the casing at one end, and said tension spring having a curved hook portion at its other end; and

a stopper secured to said casing, and extending substantially in proximity to said tension spring and said first arm portion, and having an opening; the curved hook portion of said tension spring loosely extending through said opening in direct engagement with only said stopper at high pressure, and in direct engagement with only said first arm portion of the actuating plate at low pressure.

4,182,942

PUFFER-TYPE GAS-BLAST CIRCUIT BREAKER

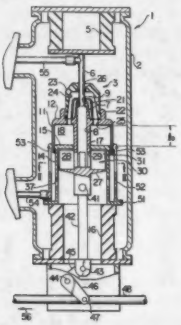
Osamu Koyanagi; Ken-ichi Natsui, and Yoshio Yoshioka, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 28, 1977, Ser. No. 792,004

Claims priority, application Japan, May 4, 1976, 51-49973

Int. Cl.[2] H01H *33/88*

U.S. Cl. 200—148 A **28 Claims**



1. A puffer type gas-blast circuit breaker including at least one interrupting unit mounted in a vessel filled with an arc extinguishing gas of a unitary pressure, said interrupting unit comprising:

a pair of contacts positioned in alignment with but in opposed relation to each other, and movable toward and away from each other to be engaged with and to be disengaged from each other respectively, at least one of said pair of contacts having therein an axial hollow portion, said axial hollow portion having an opening in that axial free end face of said one contact which is opposed to the other contact, wherein an arc is established between said pair of contacts, upon disengagement of said pair of contacts from each other;

a first cylinder and a first piston within said first cylinder to define a compression chamber filled with an arc extinguishing gas, said first cylinder and piston being movable relative to each other in association with the relative movement of said pair of contacts;

first communicating means for communicating said compression chamber with said axial hollow portion through said opening;

a second cylinder and a second piston within said second cylinder to define a suction chamber, said second cylinder and piston being movable relative to each other in association with the relative movement of said pair of contacts;

second communicating means for communicating said axial hollow portion with said suction chamber, wherein when said pair of contacts are relatively moved away from each other, an arc extinguishing gas in said compression chamber is compressed and a volume of said suction chamber is enlarged, and wherein when said pair of contacts are disengaged from each other, a pressure difference between said compression chamber and said suction chamber causes said arc extinguishing gas to be directed from said compression chamber via said first communicating means, said opening in said axial hollow portion and said second communicating means into said suction chamber, thereby to be blown against an arc produced between said pair of contacts; and

means disposed in said suction chamber for cooling an arc extinguishing gas introduced into said suction chamber.

4,182,943

PUSH BUTTON DEVICE

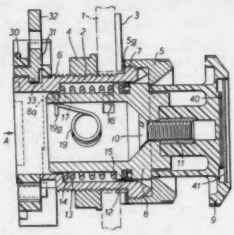
Edmund M. Butterworth, Bedford, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed May 30, 1978, Ser. No. 910,621

Claims priority, application United Kingdom, Jun. 17, 1977, 25511/77

Int. Cl.[2] H01H *3/12*

U.S. Cl. 200—159 R **12 Claims**



1. A push-button device for controlling electrical apparatus, said push-button device comprising:

mounting means;

a push-button head mounted in said mounting means and movable along an axis between a normal position and a depressed position;

biasing means for biasing said push-button head toward said normal position, whereby said push-button head is manually depressible from its normal position to its depressed position;

detent means formed on said mounting means;

a latching spring carried by said push-button head, said latching spring having portions biased outwardly of said push-button head to engage said detent means upon depression of said push-button head to latch the latter in its depressed position;

and said push-button head including manually turnable means for retracting said latching spring to cause said push-button head to be returned to its normal position by said biasing means.

4,182,944

TOGGLE SWITCH WITH A LIGHT EMITTING DIODE ELEMENT ATTACHED TO THE TOP END OF A KNOB

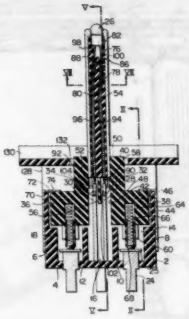
Minoru Sano, Yokosuka, Japan, assignor to Fujisoku Electric Co., Ltd., Kawasaki, Japan

Filed May 30, 1978, Ser. No. 910,287

Claims priority, application Japan, Jun. 2, 1977, 52/71714[U]; Jun. 2, 1977, 52/71715[U]; Aug. 30, 1977, 52/115888[U]

Int. Cl.[2] H01H *9/16, 1/20, 3/04*

U.S. Cl. 200—315 **8 Claims**



1. A toggle switch, comprising:

a light emitting diode element having at least two lead wires for power supply and provided with a base from which said lead wires are extended and a light emitting portion attached to said base;

a cylindrical knob receiving the base of said light emitting diode element, the light emitting portion of said light emitting diode element being exposed through one end of said knob;

an elongated electrically insulating spring holder having at least two long and narrow holes extending along the axial direction thereof and into which the lead wires of said light emitting diode elements are separately inserted through one-end openings thereof, and spring stoppers formed in each said hole in close vicinity to said one-end openings, and fitted in said knob;

conductive metal spring members contained in each said hole of the spring holder, having one end brought in contact with each said spring stopper, and being in contact at a plurality of portions with the lead wires inserted in each said hole;

a rockable member fitted with the other end of said knob and capable of being rocked within a predetermined angle by operating said knob;

a case for rockably supporting said rockable member;

a common terminal and two switching terminals made of a conductive metal, fixed to said case, and extending out from said case;

a conductive metal movable contact mounted on the ends of said terminals inside said case and being always in contact with said common terminal as well as with either of said two switching terminals;

a spring-biased rod with one end held by said rockable member and the other end spring-biased to bear against said movable contact, said other end sliding on said movable contact in response to a turn of said rockable member to switch said movable contact from one switching terminal to the other switching terminal; and

at least two conductive metal power supply terminals fixed to said case and each having one end substantially in alignment with the center of rocking of said rockable member inside said case, located in close vicinity to the other-end opening of each hole of said holder, and electrically connected with the other end of each spring member contained in said hole, and the other end of each power supply terminal extending outside said case.

8. A toggle switch, comprising:

a light emitting diode element having at least two lead wires for power supply and provided with a base from which said lead wires are extended and a light emitting portion attached to said base;

a cylindrical knob receiving the base of said light emitting diode element, the light emitting portion of said light emitting diode element being exposed through one end of said knob;

an elongated electrically insulating spring holder having at least two long and narrow holes extending along the axial direction thereof and into which the lead wires of said light emitting diode element are separately inserted through one-end openings thereof, and stoppers formed in each said hole in close vicinity to said one-end openings, and fitted in said knob;

conductive metal spring members contained in each said hole of the spring holder;

electrically conductive connecting members, each attached to one end of a respective spring member and engaging a stopper in a respective hole of said spring holder, each said connecting member being mounted so as to be biased by its respective spring member against the respective lead wire inserted in each corresponding hole of said spring holder;

a rockable member fitted with the other end of said knob and capable of being rocked within a predetermined angle by opertating said knob;

a case for rockably supporting said rockable member;

a common terminal and two switching terminals made of a conductive metal, fixed to said case, and extending out from said case;

a conductive metal movable contact mounted on the ends of said terminals inside said case and being always in contact with said common terminal as well as with either of said two switching terminals;

a spring-biased rod with one end held by said rockable member and the other end spring-biased to bear against said movable contact, said other end sliding on said movable contact in response to a turn of said rockable member to switch said movable contact from one switching terminal to the other switching terminal; and

at least two conductive metal power supply terminals fixed to said case and each having one end substantially in alignment with the center of rocking of said rockable member inside said case, located in close vicinity to the other-end opening of each hole of said holder, and electrically connected with the other end of each spring member contained in said hole, and the other end of each power supply terminal extending outside said case.

4,182,945

PUSH-UP LIPSTICK OR THE LIKE CONTAINER

James M. McArdle, Cheshire, and Edward F. Klimeck, Waterbury, both of Conn., assignors to Eyelet Specialty Co., Inc., Wallingford, Conn.

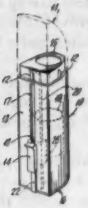
Filed Sep. 29, 1978, Ser. No. 946,970

Int. Cl.[2] A45D *40/00*

U.S. Cl. 206—385 **11 Claims**

1. A "push-up" lipstick or the like container, comprising a tubular body having an open upper end and a closed lower end, said body having an elongate relatively narrow slot providing external access to the interior of said body, an elongate guide member of substantially uniform width greater than the width of said slot and carried by said body at one of the ends of said body and at a location which positions said guide member within said body and in overlap with said slot but at radially offsetting clearance with the body wall at said slot, and a carrier member longitudinally movable in said body, said car-

rier member including a manual actuating tab extending through said slot, said tab having guide-piloting formations



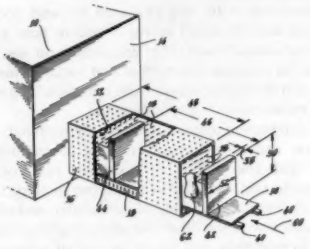
engaged to and deriving guided support from said guide member.

4,182,946

METHOD AND APPARATUS FOR ELIMINATING MICROWAVE LEAKAGE AT THE CONVEYOR PORTAL OF A MICROWAVE OVEN

I. R. Wayne, and Bernard Krieger, both of Stamford, Conn., assignors to Cober Electronics, Inc., Stamford, Conn.

Filed Nov. 28, 1977, Ser. No. 855,171
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 A 19 Claims



1. A choke for eliminating microwave leakage from a microwave oven, comprising:

a walled channel formed of electrically conducting material;

partitions suitable for passage through said walled channel;

means for transporting said partitions through said walled channel, said partitions being formed of electrically conducting material and having peripheral walls in the direction of travel through said walled channel parallel to the walls of said walled channel;

protrusions of electrically conducting material between the channel walls and the partitions' peripheral walls extending normally to the direction of conveyor travel through said channel, said protrusions having uniform length and spacing therebetween, the free end of each of said protrusions extending to a position adjacent their respective opposing wall;

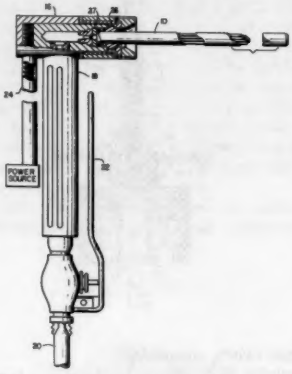
said partitions having a length along their direction of travel through said channel to overlie at least two consecutive protrusions.

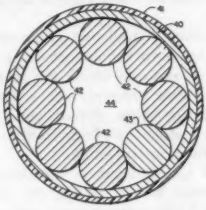
4,182,947

UNDERWATER CUTTING ROD

Jerome S. Brower, 2040 N. Towne Ave., Pomona, Calif. 91767

Continuation-in-part of Ser. No. 639,289, Dec. 10, 1975, Pat. No. 4,069,407. This application Feb. 4, 1977, Ser. No. 765,695
The portion of the term of this patent subsequent to Jan. 17, 1995, has been disclaimed.
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—70 8 Claims





1. A cutting torch primarily for underwater use in which electrical current and reactive gas flow are used in combination to cause progressive burning of a substantially rigid metallic electrode, the torch comprising

a substantially rigid metallic electrode comprising

a substantially rigid metallic tube;

a plurality of ferrous metal rods extending longitudinally within said tube from one end thereof to the other;

at least one rod made of a metal selected from the group consisting of aluminum, magnesium, titanium and alloys thereof disposed within said tube; and

a layer of insulating material substantially covering the exterior surface of said tube;

means for connecting a source of electrical current to said tube and for applying electrical current thereto; and

means for connecting a supply of reactive gas to said tube,

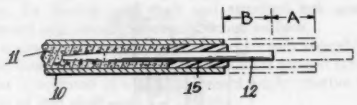
said ferrous rods and said at least one rod being circularly arranged in said tube against the inner surface thereof with the centers of said rods lying substantially on circle having as its center the central axis of said tube, the arrangement of said rods defining a central channel along the axis of said tube.

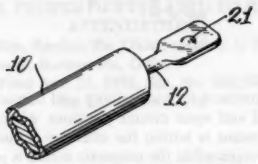
4,182,948

ELECTRIC HEATING ELEMENTS

Thomas R. Markum, and Charles E. Bryson, Jr., both of Murfreesboro, Tenn., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jul. 21, 1978, Ser. No. 926,854
Int. Cl.[2] H05B 3/08
U.S. Cl. 219—541 **1 Claim**





1. An electric heating element, comprising a tubular metal sheath, a resistance conductor within said sheath and having a solid, round metal terminal pin centrally positioned in said sheath and electrically connected to an end of said resistance conductor, an integral end portion of said terminal pin extending outwardly of an end of said sheath, insulating material within said sheath for holding said resistance conductor and said terminal pin spaced from the inner wall surface of said sheath and for conducting heat from said resistance conductor to said sheath, and

a spade-like male terminal comprising a coined deformation of the end of said extending terminal pin end portion and a dimple substantially in the middle portion of the spade-like male terminal, adapted for snap-action connection to a female terminal to which a power conductor is connected.

4,182,949

SELF-CONTAINED, PORTABLE UNDERWATER STUD WELDER

Gaylord D. Powers, and Donald G. Quist, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 707,471, Jul. 21, 1976, abandoned. This application Jul. 10, 1978, Ser. No. 922,954
Int. Cl.[2] B23K 9/20
U.S. Cl. 219—98 **7 Claims**

1. A portable stud welder which may be used under water, comprising:

a hand-held stud welding gun;

a capacitor bank connected to said hand-held stud welding gun;

a voltage sensing circuit connected to said capacitor bank;

an AND gate having first and second inputs, said first input being an inverting input,

said first input connected to the output of said voltage sensing circuit,

said second input connected to said stud welding gun;

a charge start switch, connected to the output of said AND gate, said charge start switch configured to be turned off by said AND gate;

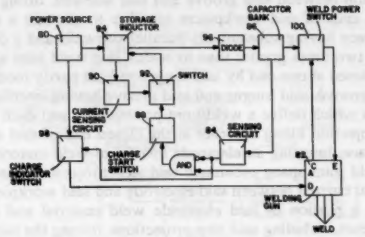
a charge indicator switch connected to said voltage sensing circuit;

a battery connected to said charge indicator switch;

a storage inductor connected to said battery;

a current sensing circuit connected to said storage inductor;

a switch connected between said storage inductor and said



charge start switch, said switch turned on by a signal from said charge start switch and said switch turned off by a signal from said current sensing circuit; and

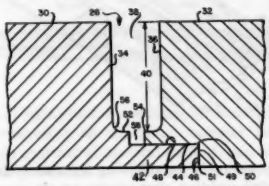
a diode connected between said storage inductor and said capacitor bank.

4,182,950

DEEP FILL WELDING JOINT CONFIGURATION AND WELDING METHOD

Lawrence A. Boros, 4345 Bunker Rd., West Bloomfield, Mich. 48033

Continuation of Ser. No. 648,598, Jan. 12, 1976, abandoned, which is a continuation of Ser. No. 405,662, Oct. 11, 1973, abandoned. This application Jan. 12, 1978, Ser. No. 868,955
Int. Cl.[2] B23K 9/00; F16L 13/02
U.S. Cl. 219—137 R **5 Claims**



1. A deep fill weld joint configuration facilitating connecting two workpieces having spaced apart end surfaces that comprise opposed sidewalls of a weld joint space, a first of said workpieces being formed with a tongue projecting from an extremity of said first workpiece end surface, said tongue being at least partially received in a groove formed in the end surface of the second of said workpieces at an extremity thereof and closing the bottom of said weld joint space, the surface of the tongue opposite the weld joint space being in substantially the same plane as a major surface of said second workpiece an interface between said tongue and a workpiece surface partially defining said groove and comprising a weld joint parting line, said spaced apart end surfaces being substantially parallel and the depth of said weld joint space being at least two times greater than its width, and a part of each workpiece forming an extension shoulder projecting from its respective end surface adjacent said tongue, one of said extension shoulders providing workpiece heat accumulation material located between said parting line and said weld joint space and the other said shoulder extension providing workpiece heat accumulation material located between an extension of said parting line and said weld joint space, with said parting line oriented to extend substantially tangentially with the root of the weld.

5. A method of joining two workpieces together by welding comprising the steps of: forming an end of one workpiece to

provide a substantially flat sidewall, a tongue projecting from said sidewall and a step projection at the intersection of said sidewall and said tongue, forming one end of the other said workpiece to provide a substantially flat sidewall, a groove adapted to receive at least part of said tongue, and a step projection between said groove and said sidewall, fitting said formed ends of said workpieces together to provide a weld joint space having substantially parallel sidewalls and a depth at least two times greater than its width, said weld joint space being closed at one end by said tongue at least partly received in said groove, said tongue and said groove having interfacing surfaces which define a weld joint parting line, and each said step projection filling a corner at the closed end of said weld joint space, inserting an electrode formed of weld material in said weld joint space proximate said step projections, arcing electrical current between said electrode and said workpieces, melting a portion of said electrode weld material and said workpieces, including said step projections, mixing the melted weld and step projection material to form a root at the bottom of said weld joint space with said parting line extending substantially tangentially from said root, and filling said space with melted weld and workpiece material to form a composite weld of substantially uniform thickness.

4,182,951

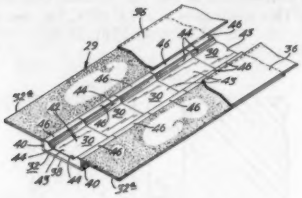
WELD BACK UP ASSEMBLY

Benedict A. Kuder, Drexel Hill, Pa., assignor to B. A. Kuder Co., Philadelphia, Pa.

Continuation of Ser. No. 737,784, Nov. 1, 1976, abandoned. This application May 15, 1978, Ser. No. 906,069

Int. Cl.[2] B23K *9/02*

U.S. Cl. 219—160 **9 Claims**



1. A back up assembly for shielding the underside of a weldment joint during welding, comprising: an elongated, flexible, metallic strip and a plurality of wafer like blocks of steatite arranged in a row and mounted centrally of said strip, said blocks being of a transverse dimension less than the width of said strip to expose side edge regions on either side of said row, and adhesive means on said side edge regions to secure said assembly to said weldment during welding.

4,182,952

CENTRIFUGAL SWITCH

Harry O. Moore, Charlotte, N.C., assignor to Chris Combis; part interest

Filed Sep. 1, 1977, Ser. No. 829,633

Int. Cl.[2] H01H *35/10*

U.S. Cl. 200—80 R **11 Claims**

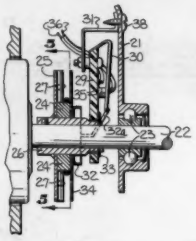
1. A centrifugal switch which comprises:

magnetic means for exerting a magnetic field;

means mounting said magnetic means for rotation about an axis and for radial sliding movement under the influence of centrifugal force from a starting position adjacent said axis to an operating position radially outwardly therefrom;

spring means for exerting on said magnetic means a force biasing said magnetic means toward the starting position and for maintaining said magnetic means at the starting position adjacent the axis while stationary, the biasing force of said spring means being overcome by the influence of centrifugal force so as to permit said magnetic means to move to the operating position; and

electrical switch means operatively responsive to movement of said magnetic means from the starting position to the operating position, said electrical switch means including a pair of contacts movable to closed and open circuit positions and ferro-magnetic means movable axially of the axis of rotation of said magnetic means and cooperating



with said contacts for maintaining said contacts in one of said closed and open circuit positions when said ferro-magnetic means is within the effective influence of said magnetic means while the magnetic means is positioned in the starting position and for maintaining said contacts in the other of said closed and open circuit positions when said ferro-magnetic means is outside of the effective influence of said magnetic means while the magnetic means is positioned in the operating position.

4,182,953

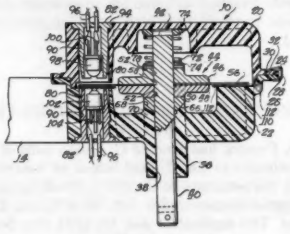
ROTATING SHAFT PULSE GENERATING APPARATUS

George L. Hurley, III, Alpine, and Michael S. Krystek, Spring Valley, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Jan. 17, 1978, Ser. No. 870,115

Int. Cl.[2] G01D *5/34*

U.S. Cl. 250—231 SE **30 Claims**



1. Apparatus for generating electrical signals in response to the rotation of a shaft, comprising:

a housing having first and second sections, said sections mating with one another, one of said sections having a circular opening therein for receiving an elongated rotatable shaft;

an elongated rotatable shaft located in said opening and extending outwardly of said housing, said shaft being adapted for attachment to an external shaft or the like;

a hub assembly attached to said shaft and located within said housing, said assembly being rotatable with said shaft and carrying a generally flat circular disc member having a plurality of spaced apart radially oriented opaque segments positioned around the outer periphery thereof, the areas between adjacent opaque segments defining light transmitting segments, said hub assembly having an end

bearing surface in contact with an internal bearing surface on one of said housing sections;

at least one light producing means located on one side of said disc within said housing;

at least one means for generating electrical signals in response to the detection of the presence and absence of light, said generating means being located on the side of said disc opposite said light producing means;

means for biasing said shaft and attached hub assembly toward said housing section internal surface;

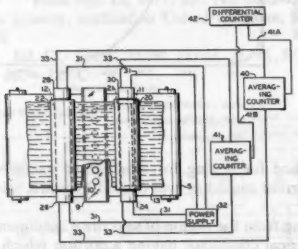
said contacting bearing surfaces of said hub assembly and said housing section defining an annulus around said shaft that is oriented at a predetermined angle relative to the axis of said shaft.

4,182,954

METHOD AND APPARATUS FOR MEASURING MATERIAL PROPERTIES RELATED TO RADIATION ATTENUATION

Richard F. Giles, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 21, 1978, Ser. No. 898,554
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—308 **18 Claims**



1. An apparatus for measuring properties of a material related to the attenuation of radiation by said material comprising:

(a) a primary detector detecting a first type and a second type of radiation and producing first, pulsed signals, the number of which is representative of the intensity of said first type and said second type of radiation;

(b) a secondary detector detecting said first type of radiation but not detecting said second type of radiation and producing second pulsed signals, the number of which is representative of the intensity of said first type of radiation;

(c) at least one nuclear radiation source which emits both said first type and said second type of radiation and which lies spaced apart from said detectors so that said material can be oriented between said source and said detectors; and

(d) means for combining the pulsed signals produced by said detectors to obtain a measure of the intensity of said second type of radiation which has penetrated said material.

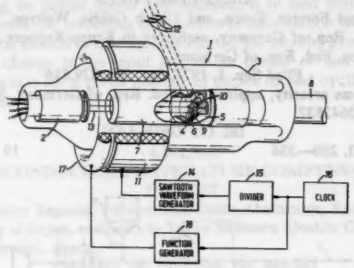
4,182,955

X-RAY GENERATING TUBES

Gordon P. Davis, Sunbury-on-Thames, England, assignor to E M I Limited, Hayes, England

Filed Jun. 1, 1978, Ser. No. 911,405
Claims priority, application United Kingdom, Oct. 26, 1977, 44648/77
Int. Cl.[2] H05G *1/30*
U.S. Cl. 250—402 **2 Claims**

1. An X-ray tube having an elongated, X-ray emissive anti-cathode, a source of an electron beam and means for deflecting the beam in steps across said anti-cathode, causing the beam to dwell at, and X-rays to be emitted from, a sequence of spaced locations distributed across said anti-cathode, wherein the surface of said anti-cathode upon which said beam impinges is corrugated in alternate ridges and lands running transversely



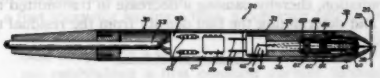
to the direction in which the deflection of the beam occurs and with the said locations disposed in said lands; the beam alternately sweeping rapidly across the ridges and dwelling in the lands.

4,182,956

OPTICAL LIGHT PEN

James B. Funk, Jr., Fairfield, Conn., and Walter R. Linke, Chicago, Ill., assignors to DeVar Inc., Bridgeport, Conn.

Continuation-in-part of Ser. No. 457,000, Apr. 1, 1974, abandoned. This application Feb. 5, 1975, Ser. No. 547,305
Int. Cl.[2] H01J *5/02*
U.S. Cl. 250—239 **3 Claims**



1. An optical light pen for reading information imprinted on a surface, comprising an elongated housing having means defining a light aperture at one end thereof, said housing being adapted to be positioned so that said light-aperture-defining means is in contact with the imprinted surface and is movable therealong, detector means in said housing for producing electrical signals in response to and in accordance with light received thereby, a plurality of light-emitting diodes in said housing, means for directly generally toward said light aperture the light from said light-emitting diodes, whereby in use light from said light-emitting diodes will be focused onto the coded information on the imprinted surface, and lens means in said housing for focusing onto said detector means light reflected by the imprinted surface, said lens means including first and second lens elements, the space between said detector means and said first lens element being 0.765 inches, the space between said lens elements being 0.375 inches, and the space between said second lens element and said light aperture being 0.75 inches, each of the surfaces of said lens elements being defined by the aspheric formula

$$\frac{K(H^2 - Z_0^2) + 2AH^4}{2(1 - KZ_0)}$$

wherein H is the variable along the ordinate axis, Z_0 is the variable along the abscissa axis, K = 1.37500 and A = 1.9000 for the surfaces respectively nearest said detector means and said light aperture, and K = 1.37500 and A = −0.14640 for the facing surfaces of said lens elements, each of said lens elements having a thickness of 0.100 inches, a refractive index of 1.490 and a dispersion of 57.4.

4,182,957

PROCESS FOR DETERMINING THE FUEL FLOW INTO THE GASIFIER OF A PARTIAL OXIDATION INSTALLATION FOR SOLID, FINE-GRAIN OR DUST-LIKE FUELS

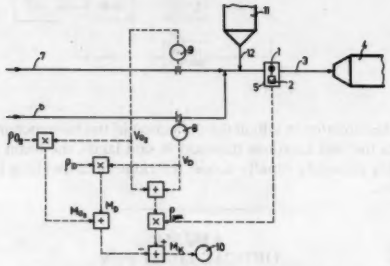
Manfred Forster, Essen, and Ulrich Geidis, Waltrop, both of Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 1, 1977, Ser. No. 829,814

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642537

Int. Cl.[2] G01F *1/00*

U.S. Cl. 250—356 10 Claims



1. A process for determining the fuel flow into the gasifier of a partial oxidation installation employing fine grained or dust-like solid fuels, which comprises passing the suspended fuel particles between a radioactive source of radiation and a means for detecting radiation, thereby causing a decrease in transmitted radiation, thereby causing a decrease in transmitted radiation; and determining the fuel density from the residual transmitted radiation.

4,182,958

METHOD AND APPARATUS FOR PROJECTING A BEAM OF ELECTRICALLY CHARGED PARTICLES

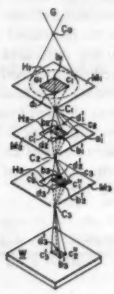
Eiichi Goto, Fujisawa; Masanori Idesawa, Wako; Tateaki Sasaki, Tokyo, and Takashi Soma, Kiyose, all of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

Filed May 25, 1978, Ser. No. 909,217

Claims priority, application Japan, May 31, 1977, 52-63873; Jun. 25, 1977, 52-75760

Int. Cl.[2] A61K *27/02*

U.S. Cl. 250—492 A 5 Claims



1. An apparatus for varying-and-projecting a beam of electrically charged particles comprising: a gun for supplying the beam; at least three apertured masks; deflectors and lens means; and mean for supplying electric signals of two kinds to said deflectors, deflectors associated with some of the apertured masks upstream being responsive to the electric signal of one kind for reducing the beam to the amount which is required in forming the exact shape of a desired image plus a marginal portion on a target, whereas deflectors associated with the apertured masks downstream being responsive to the electric signal of the other kind for trimming the beam into the exact shape of the desired image.

4,182,959

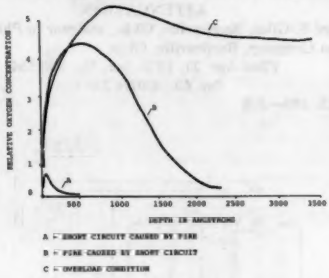
METHODS FOR USE IN FIRE INVESTIGATION

Randall C. MacCleary, and Ronald N. Thaman, both of Worthington, Ohio, assignors to SEA Investigation Division, Inc., Columbus, Ohio

Filed Jul. 27, 1978, Ser. No. 928,527

Int. Cl.[2] A61K *27/02*

U.S. Cl. 250—492 R 12 Claims


RELATIVE OXYGEN CONCENTRATION
DEPTH IN ANGSTROMS
A – SHORT CIRCUIT CAUSED BY FIRE
B – FIRE CAUSED BY SHORT CIRCUIT
C – OVERLOAD CONDITION

1. A method for testing for whether an excessively high electrical current caused or was caused by a fire, said method comprising:

(a) selecting from the region of said fire a specimen which is an electrical conductor having a portion which has been melted after original manufacture; and

(b) measuring and recording the relative oxygen concentration at a plurality of depths below the surface of said melted portion.

4,182,960

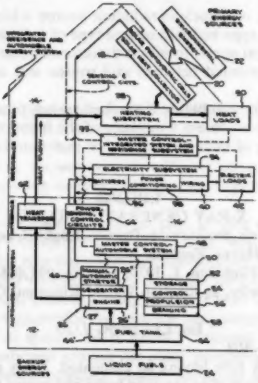
INTEGRATED RESIDENTIAL AND AUTOMOTIVE ENERGY SYSTEM

John S. Reuyl, 2280 Hanover St., Palo Alto, Calif. 94306

Filed May 30, 1978, Ser. No. 910,234

Int. Cl.[2] H02P *9/04*

U.S. Cl. 290—1 R 19 Claims



12. A method of selectively transferring energy within an integrated energy system comprising a residence and an auto-

mobile wherein environmental energy is the primary energy source for said system and wherein said automobile provides a supplementary source of energy for said system, said energy being selectively transferred from said residence to said automobile and from said automobile to said residence, comprising the steps of:

sensing electrical energy storage levels within residential energy storage means and automobile electrical storage means;

transferring electrical energy from said residential energy storage means to said automobile electrical storage means when said electrical energy storage level of said residential energy storage means is greater than or equal to a preselectable value and when said electrical energy storage level of said automobile electrical storage means is less than a maximum storage value; and

transferring electrical energy from said automobile to said residential energy storage means when said electrical energy storage level of said residential energy storage means is less than a preselectable value.

4,182,961

INHIBITABLE COUNTER STAGE AND COUNTER

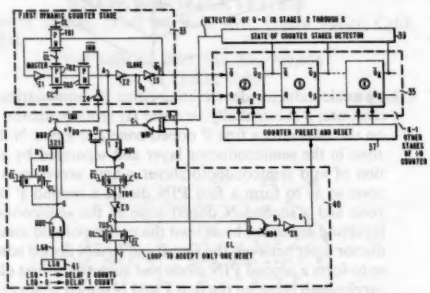
Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,463

Claims priority, application United Kingdom, Sep. 27, 1976, 40028/76

Int. Cl.² H03K *23/08, 21/32, 21/36, 3/353*

U.S. Cl. 307—225 C **17 Claims**



1. The combination comprising:

a counter stage including:

(a) first and second sections, each section having an input and an output, one of said first and second sections producing at its output a signal which is 180° out-of-phase with a signal at its input, and the other one of said first and second sections producing at its output a signal in-phase with the signal at its input;

(b) first gating means connected between the output of said first section and the input of said second section; said first gating means being responsive to cyclical signals and inhibit signals; and

(c) second gating means connected between the output of said second section and the input of said first section;

a source of cyclical signals having first and section portions per cycle;

first means applying said cyclical signals to said first gating means for, in the absence of an inhibit signal, enabling said first gating means for transferring the output of said first section to the input of said second section during said first portion of each cycle, and for disabling said first gating means during the second portion of each cycle;

second means applying said cyclical signals to said second gating means for enabling said second gating means for transferring the output of said second section to the input of said first section during said second portion of each cycle, and for disabling said second gating means during the first portion of each cycle; and

third means, including counting means, responsive to a predetermined number of pulses produced at the output of at least one of the sections of said counter stage, for producing an inhibit signal and applying it to said first gating means for inhibiting the transfer of information from said first section to said second section, for thereby preventing a change at the input and at the output of said second section for a given number of cycles of said cyclical signals.

4,182,962

SEMICONDUCTOR TEMPERATURE COMPENSATION CIRCUIT

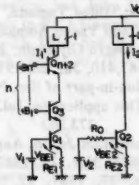
Shinichiro Taguchi, Fukaya, and Tokio Aketagawa, Kumagaya, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 12, 1977, Ser. No. 841,581

Claims priority, application Japan, Oct. 16, 1976, 51/123430

Int. Cl.² H03K *17/60, 5/08*

U.S. Cl. 307—254 **5 Claims**



1. A compensating circuit comprising:

a first signal path including:

a first transistor having a base, a collector and an emitter, said emitter coupled to a first potential source, and said base coupled to a second potential source, said transistor establishing a first constant current through said collecter;

n transistors cascade-coupled to said collector of said first transistor, said first constant current flowing through said cascade of transistors; and

a first load coupled between said cascade of n transistors and a third potential source;

a second signal path including;

a second transistor having a base, a collector and an emitter, said emitter coupled to said first potential source through an emitter impedance and said base coupled to a fourth potential source through a base impedance, said transistor establishing a second constant current; and

a second load coupled between said collector of said second transistor and said third potential source, said second constant current flowing therethrough, wherein the ratio between said base and emitter impedances of said second transistor is substantially equal to n.

4,182,963

PULSE SHAPING CIRCUIT

Tsuneo Yamada, and Yukihiko Miyamoto, both of Tokyo, Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,539

Claims priority, application Japan, Dec. 28, 1976, 51-159459

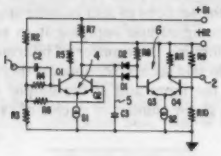
Int. Cl.² H03K *5/01*

U.S. Cl. 307—268 **4 Claims**

1. A pulse shaping circuit for producing a shaped output pulse having a predetermined amplitude and width comprising

a difference amplifier having an input terminal for receiving an input pulse to be shaped and for producing first and second signals having at least a square wave leading edge at first and second output terminals;

an integration circuit for integrating said second signal to produce a ramp signal; and



an AND circuit having applied thereto said first signal and the ramp signal produced by said integration circuit for developing said shaped output pulse corresponding to the input pulse.

4,182,964

NEGATIVE RESISTANCE ELEMENT CIRCUIT COMBINATIONS

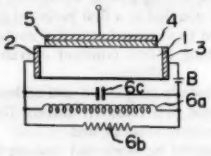
Shoei Kataoka; Hiroshi Tateno, both of Tanashi; Hiroyuki Fujisada, Tachikawa; Hideo Yamada, Tokyo; Mitsuo Kawashima, Tokorozawa, and Yasuo Komamiya, Yokohama, all of Japan, assignors to Kogyo Gijutsuin, Japan

Division of Ser. No. 167,410, Jul. 28, 1971, Pat. No. 3,691,481, which is a continuation-in-part of Ser. No. 776,292, Aug. 20, 1968, abandoned. This application Jul. 20, 1972, Ser. No. 273,363

Claims priority, application Japan, Aug. 22, 1967, 42/53488; Nov. 27, 1967, 42/75628; Nov. 27, 1967, 42/75629; Nov. 27, 1967, 42/75630; Nov. 27, 1967, 42/75631; Mar. 8, 1968, 43/14765

Int. Cl.[2] H03B *7/14;* **H03F** *3/10*

U.S. Cl. 307—299 **4 Claims**



1. In combination: a negative resistance solid state element comprising a solid body composed of semiconductor material having at least two ends and exhibiting a negative resistance characteristic when placed in a high electric field; an electrode ohmically attached to each of said ends; means for applying an electric voltage across said electrodes to produce a high electric field across said solid body; a dielectric member covering at least one part of said solid body; a control element reactively coupled to said solid body through said dielectric member at a portion intermediate said electrodes effective to control high field domains created in said solid body during application of said high electric field across said solid body to suppress said high field domains and establish in said solid body a negative differential resistance; and a tuning circuit connected in parallel across said electrodes; whereby high frequency oscillations having a frequency determined by the circuit constants of said tuning circuit may be obtained.

3. A system for performing logic operations comprising: a negative resistance solid state element having a solid body composed of semiconductor material and having at least two ends and exhibiting a negative resistance characteristic when placed in a high electric field; an electrode ohmicly attached to each of said ends; means for applying an electric voltage across said electrodes to produce a high electric field across said solid body having a magnitude almost equal to the critical voltage at which electric oscillations occur in said solid state element; a dielectric member covering at least one part of said solid body; a control element reactively coupled to said solid body through said dielectric member at a portion intermediate said electrodes effective to control high field domains created in said solid body during application of said electric voltage across said solid body to suppress said high field domains and establish in said solid body a negative differential resistance; and means for applying a pulse signal to said control element to promote or prevent electric oscillations in said solid state element; whereby logic operations may be performed in dependence upon the signal applied to said control element.

4,182,965

SEMICONDUCTOR DEVICE HAVING TWO INTERSECTING SUB-DIODES AND TRANSISTOR-LIKE PROPERTIES

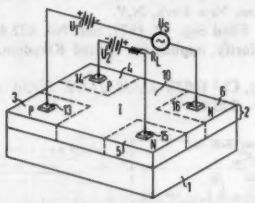
Hans Pfleiderer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 16, 1977, Ser. No. 825,148

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1976, 2636873

Int. Cl.[2] H01L *27/12*

U.S. Cl. 307—299 R **14 Claims**



1. A semiconductor device comprising in combination:

a substrate; a substantially intrinsic (I) semiconductor layer on the substrate; a first P doped zone and a first N doped zone in the semiconductor layer and separated by a portion of said semiconductor layer which serves as a base zone so as to form a first PIN diode; a second P doped zone and a second N doped zone in the semiconductor layer and separated by at least the portion of said semiconductor layer between the first P and first N doped zones so as to form a second PIN diode and such that a first charge carrier path between the first P and N doped zones crosses through a second charge carrier path between the second P and N doped zones, the first charge carrier path being positioned to influence the second charge carrier path; the first PIN diode being biased by a first external circuit means and the second PIN diode being biased by a second external circuit means, the first and second circuit means being independent of each other in such a fashion that all four zones may have different potentials; and said connecting line between said second doped zones intersecting said connecting line between said first doped zones at right angles.

4,182,966

VENTILATION SYSTEM FOR DYNAMOELECTRIC MACHINES

Anil K. Mishra; Joel B. Hammer, both of Pittsburgh, and Kenneth M. Sochats, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

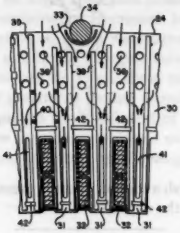
Continuation of Ser. No. 587,790, Jun. 16, 1975, abandoned. This application Aug. 23, 1977, Ser. No. 827,044

Int. Cl.[2] H02K *9/00*

U.S. Cl. 310—59 **4 Claims**

1. A dynamoelectric machine having a stator member and a rotor member separated by an air gap, said rotor member having salient poles and a ventilation system sealed off from the air gap, said stator member including a cylindrical stator

core having a central bore with teeth extending longitudinally of said bore to form slots for stator windings, a plurality of longitudinally-spaced vent ducts extending radially through the core, a plurality of longitudinal ducts in said teeth of said core and extending between said vent ducts, means for sealing said longitudinal ducts and said vent ducts from the air gap,



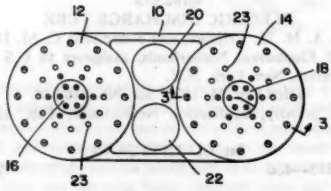
and means for causing ventilating gaseous fluid to flow radially inward in a first group of said plurality of vent ducts and longitudinally in both directions in said longitudinal ducts from said first group to vent ducts of a second group of said plurality of vent ducts and radially outward in said second group, said first group of vent ducts being alternately disposed in the longitudinal direction with ducts of said second group.

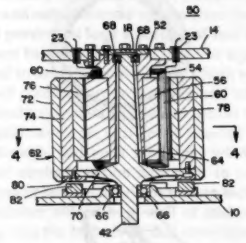
4,182,967

ENERGY STORAGE SYSTEM

Robert D. Jordan, 21741 Baywood Ave., Castro Valley, Calif. 94546

Filed May 23, 1977, Ser. No. 799,404
Int. Cl.[2] H02K *7/02*
U.S. Cl. 310—74 **4 Claims**





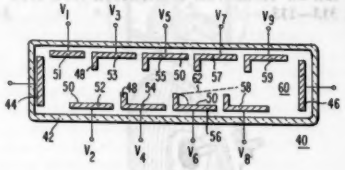
1. An energy storage system comprising:
(a) a case;
(b) a motor having a vertical spindle extending therefrom, said motor converting a low power source of electrical energy into mechanical energy, said motor mounted in said case and detachably connected to said low power source;
(c) a cylindrical flywheel for storing said mechanical energy rotatably mounted in said case having a central vertical shaft about which said flywheel operates and a ring extension rigidly connecting said shaft to said flywheel, said flywheel having laminate construction of a plurality of concentric cylinders;
(d) a gear system for transferring rotary motion of said spindle into rotary motion of said flywheel about said shaft whereby an idler gear is disengagably connected between a motor gear mounted on said spindle and a flywheel gear mounted upon an extension of said shaft, said motor gear disengagably connected with said motor; and
(e) means for rapidly discharging said mechanical energy as high power electrical energy, said high power electrical discharge having very short time duration and constant voltage such that many such discharges occur before significant degradation of said stored mechanical energy occurs.

4,182,968

ELECTRON MULTIPLIER WITH ION BOMBARDMENT SHIELDS

Scott A. Keneman, Trenton, and John G. Endriz, Plainsboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,841
Int. Cl.[2] H01J *43/10, 43/20*
U.S. Cl. 313—105 R **2 Claims**



1. An ion feedback electron multiplier comprising:
an envelope;
means for generating ions within the envelope;
a plurality of dynodes in the envelope arranged in a chain comprising two groups of dynodes being spaced from and substantially parallel to each other;
a source of electrons within the envelope at one end of the dynode chain, the source being capable of emitting electrons upon ion bombardment; and
means in the envelope for preventing ions from bombarding at least some of the dynodes without appreciably inhibiting the flow of electrons through the dynode chain or the flow of ions from the other end of the dynode chain toward the electron source, wherein said bombarding preventing means comprises a projection on at least some of the dynodes in each group, the projection extending into the space between the groups of dynodes from the end of the dynode which is nearest the electron source and toward the other group of dynodes for a distance of about 1/6 the distance between the groups of dynodes.

4,182,969

ELECTRON MULTIPLIER DEVICE WITH SURFACE ION FEEDBACK

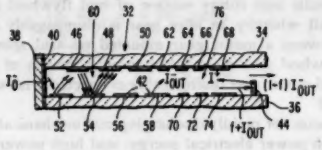
Carmen A. Catanese, Rocky Hill, and John G. Endriz, Plainsboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,558
Int. Cl.[2] H01J *43/10, 43/20, 31/08, 39/06*
U.S. Cl. 313—105 R **8 Claims**

1. An electron multiplier device heating surface ion feedback comprising,

cathode means for emitting electrons in response to ion bombardment,

multiplying means adjacent said cathode means for multiplying the number of electrons emitted from said cathode means, and



target means adjacent to and separate from said multiplying means, said target means being of a material capable of emitting ions back to said cathode means in response to electron bombardment from said cathode and multiplying means over a long period of time, said target means including a structure which at least partially blocks an output end of said multiplying means.

4,182,970

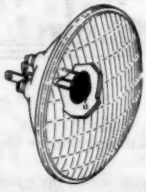
FILAMENT SHIELDS FOR PAR LAMPS

John M. Putz, Twinsburg, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,878

Int. Cl.² H01J *5/16, 61/40;* **H01K** *1/26, 1/30*

U.S. Cl. 313—113 **3 Claims**



1. In a lamp having a reflector, a lens and at least one filament, the improvement comprising:

a filament shield interposed between said filament and said lens, said filament shield comprising an iron core having the surface thereof sealed by an $FeAl_3$ coating characterized by a dark, matte finish.

4,182,971

MERCURY-CONTAINING GLASS-CAPSULE DISPENSER FOR DISCHARGE LAMPS

Robert E. Cassidy, Seabrook, N.H.; Frank M. Latassa, Magnolia, Mass.; J. Arthur Roy, Danvers, Mass., and John G. Ray, Topsfield, Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jul. 10, 1978, Ser. No. 922,944

Int. Cl.² H01J *61/28*

U.S. Cl. 313—177 **1 Claim**

1. In an arc discharge lamp having a glass mount at one end with a cathode supported on the mount, the improvement comprising: a disintegration shield encircling the cathode except for a gap between the ends of the shield; a mercury-containing glass capsule disposed at about the gap region of the shield; an axial wire disposed in the capsule sealed to and protruding beyond the ends of the capsule, each end of the wire connected to a respective side of the shield, the shield and wire forming a closed loop in which an RF current can be induced, the ends of the wire having bends therein in order to prevent inducing stresses in the glass at the time said ends are connected to the shield: and a crack in the glass of the capsule

sufficient to establish a mercury vapor pressure in the lamp due to the mercury in the capsule.

4,182,972

TRANSPARENT POLYCRYSTALLINE ALUMINA AND HIGH PRESSURE VAPOR DISCHARGE LAMP

Masayuki Kaneno, Tokoname; Isao Oda, and Noboru Yamamoto, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 6, 1978, Ser. No. 883,785

Claims priority, application United Kingdom, Mar. 10, 1977, 10198/77

Int. Cl.² H01J *17/16;* **C04B** *35/10, 35/50*

U.S. Cl. 313—221 **4 Claims**

1. A transparent polycrystalline alumina comprising alumina crystals wherein the alumina consists of 0.01 to 0.2% MgO, 0.01 to 0.2% La_2O_3, 0.01 to 0.2% Y_2O_3, the balance being alumina and the percentages being by weight of alumina, and wherein crystals having a size of at least 60 μm occupy not less than 50% of unit surface area.

4,182,973

ELECTRIC DISCHARGE TUBE

Gerardus A. H. M. Vrijssen, and Franciscus C. M. De Haas, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,528

Claims priority, application Netherlands, Feb. 12, 1976, 7613412

Int. Cl.² H01J *29/46*

U.S. Cl. 313—456 **7 Claims**

1. An electric discharge tube comprising a glass envelope having a cylindrical inner wall portion, an electrode and means for securing said electrode in said envelope, said means including a plurality of rim portions on said electrode extending radially toward said wall portion in a plane normal to the axis of said cylindrical wall portion and a plurality of spaced apart

projections extending from said wall portion and defining a plurality of grooves therebetween spaced about the circumference of said wall portion, one of the projections defining a respective one of said grooves having a side wall portion adjacent and spaced from the other projection defining said one groove a distance substantially equal to or less than the thickness of said rim portions and a second side wall portion which is inclined at an angle from said other projection such that the spacing therebetween decreases toward said first-named side wall portion so that a respective one of said rim portions is received and firmly clamped between said projections upon rotation of said electrode about said axis, said electrode being made of a material having a coefficient of expansion substantially equal to the coefficient of expansion of the glass of said envelope to minimize relative movement between said electrode and said envelope upon change in temperature.

4,182,974

GETTER CONNECTED TO CATHODE RAY TUBE HIGH VOLTAGE CONTACT

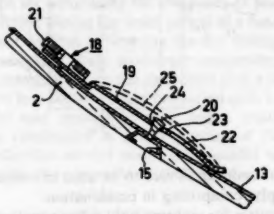
Anton J. Van Ijzeren, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,115

Claims priority, application Netherlands, Apr. 6, 1977, 7703759

Int. Cl.² H01J *29/84, 31/00*

U.S. Cl. 313—481 **10 Claims**



1. A display tube comprising an envelope having a conical portion terminating in a generally cylindrical neck and a window portion secured to the end of said conical portion opposite said neck and having a display screen on the inner surface thereof, an electrode system positioned in said neck for generating at least one electron beam directed onto said display screen, an electrically conductive layer extending between said display screen and said electrode system over the inner surface of said conical portion, at least a portion of said layer near said electrode system being an electrical resistive layer and electrically connected to the conductive layer, a high voltage contact provided in said conical portion between said window portion and said electrode system, a getter and means for detachably mounting, in said envelope, said getter inserted into said conical portion through said neck after said window portion is secured to said conical portion and prior to positioning said electrode system in said neck, said mounting means including a connecting member affixed to a wall of said conical portion and projecting into the interior of said envelope, said connecting member having a gradually widening end with a largest transverse dimension D and a smallest transverse dimension d, and a resilient metal strip affixed to said getter, said strip having a first aperture of a dimension larger than said dimension D, a second aperture of dimension A, and an opening of width b extending between said first and second apertures in a manner such that $D>A>b>d$, so that said end of said connecting member in cooperation with said second aperture form a coupling for detachably mounting said getter in said envelope.

4,182,975

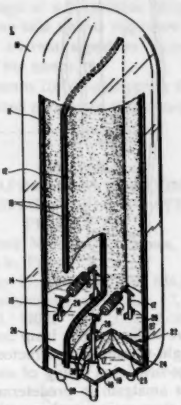
COMPACT FLUORESCENT LAMP HAVING A PARTITIONED ENVELOPE, AND METHOD OF MANUFACTURE

Robert G. Young, Nutley, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 11, 1978, Ser. No. 923,527

Int. Cl.² H01J *9/385, 61/10, 61/30, 61/42*

U.S. Cl. 313—485 **13 Claims**



1. A low-pressure electric discharge lamp adapted for use as a compact light source in fixtures designed for residential and commercial lighting applications, said lamp comprising:

a sealed light-transmitting envelope that contains an ionizable medium which sustains an arc discharge when the lamp is energized,

partition means within said envelope defining a discharge channel that traverses the envelope in tortuous fashion,

an electrode disposed at each end of said discharge channel,

conductor means extending into said envelope and connected to said electrodes,

means for confining the arc discharge to said tortuous discharge channel comprising a diaphragm assembly that extends across the interior of the envelope and is in engagement with an end portion of said partition means, said diaphragm assembly comprising (a) a porous body of material that is permeable to vapors and gases and (b) rigid holding members that are disposed in overlying sandwiched relationship with said porous body of material, and

a sealed tubulation integral with a part of said envelope that is separated from said electrodes and partition means by said diaphragm assembly,

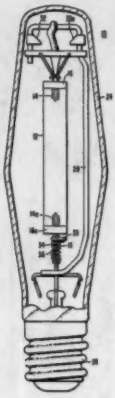
the rigid holding members of said diaphragm assembly being so shaped and arranged that the peripheral portion of said porous body of material is exposed and in contact with the wall of the envelope and said porous body of material thus comprises a gasket which prevents the arc discharge from by-passing the partition means but permits water vapor and gaseous impurities to be evacuated from the envelope through said diaphragm assembly and tubulation prior to the sealing of said tubulation.

4,182,976

HIGH PRESSURE SODIUM VAPOR LAMP WITH VOLTAGE RISE COMPENSATOR

Daniel A. Larson, Cedar Grove, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 7, 1978, Ser. No. 922,929
Int. Cl.[2] H01J 17/34
U.S. Cl. 315—49 6 Claims



1. A high pressure sodium vapor lamp comprising:

a. an elongated light-transmitting refractory arc tube enclosing a discharge-sustaining filling of sodium or mercury plus sodium as amalgam in predetermined amount and predetermined atom ratio together with a predetermined pressure of inert ionizable starting gas, electrodes operatively positioned within said arc tube proximate each end thereof, closure members sealing each end of said arc tube, and an elongated hollow refractory metal member of predetermined length and surface area projecting from an end of said arc tube and sealed through one of said closure members with the interior of said hollow metal member opening into the interior of said arc tube, and the end of said hollow metal member which projects from said arc tube being sealed;

b. a light-transmitting outer envelope, arc tube supporting means within said outer envelope for supporting said arc tube in predetermined position therein, power adaptor means affixed to the exterior surface of said outer envelope for connection to a power source, lead-in members sealed through said outer envelope and connecting said electrodes to said power adaptor means, and during the operation of said lamp the coolest spot of said elongated hollow metal member being at a predetermined temperature less than said arc tube to cause said hollow metal member to act as a condensing repository for excess discharge-sustaining filling which is not vaporized; and

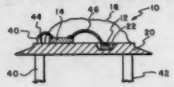
c. said hollow metal member having carried on the outer surface thereof a radiation-emissive and electricalating means, a resistive-heater member affixed proximate the exterior surface of said hollow metal member and in thermal contact with said radiation-emissive and electrical-insulating means, said resistive-heater member connected in circuit between the said electrode which is proximate said one closure member and one of said lead-in members and said resistive-heater member generating a predetermined power dissipation therein when carrying the normal operating current of said lamp to provide a heat input to said hollow metal member; whereby during prolonged operation of said lamp, voltage rises as normally encountered therewith and which tend to decrease the normal operating current for said lamp, result in less I^2R power dissipation in said resistive-heater member, thereby to decrease the heating of said hollow metal member by said resistive-heater member and thus at least in part compensate for the tendency for increased voltage to be developed across said arc tube.

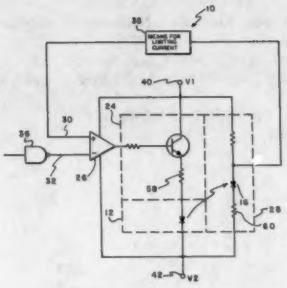
4,182,977

CONSTANT OUTPUT LIGHT EMITTING DEVICE

Robert S. Stricklin, Jr., Dallas, Tex., assignor to TRW Inc., Los Angeles, Calif.

Filed Jun. 1, 1978, Ser. No. 911,431
Int. Cl.[2] H05B 43/00
U.S. Cl. 315—158 8 Claims





1. A light emitting device to be used in conjunction with a power supply, comprising in combination:

a light emitter for emitting light when supplied with electric current, wherein an increase in electric current supplied to the light emitter increases the output light intensity;

a compensating circuit comprising an integrated circuit powered by the power supply, electrically connected to the light emitter for supplying current to the light emitter, the compensating circuit including a light sensor in proximity to and substantially to the side of the light emitter wherein the compensating circuit is responsive to the light intensity sensed by the light sensor, increasing the current supplied to the light emitter as the intensity of the light sensed decreases;

means for electrically connecting the compensating circuit to the power supply;

a substantially clear overcoat substantially covering the light emitting surface of the light emitter wherein part of the light emitted from the light emitter is transmitted through the overcoat and part of the light emitted is reflected by the overcoat to the light sensor, whereby the intensity of light transmitted through the overcoat when the light emitting device is on remains substantially constant over the useful life of the light emitter; and

a header for mounting electrical components, wherein the light emitter and the compensating circuit are mounted on the header;

wherein the header forms a recess for mounting the light emitter, and the light emitter is mounted on the header in the recess, and wherein the substantially clear overcoat substantially covers both the light sensor and the light emitting surface of the light emitter.

4,182,978

CIRCUIT FOR GENERATING A SAWTOOTH LINE DEFLECTION CURRENT

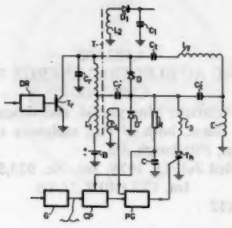
Antonius Boekhorst, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,498

Claims priority, application Netherlands, May 2, 1977, 7704771

Int. Cl.[2] H01J *29/56*

U.S. Cl. 315—371 **7 Claims**



1. A circuit for generating a sawtooth line deflection current having a trace period and a retrace period through a line deflection coil and at least one direct current voltage, said circuit comprising a controllable switch which is cutoff during the retrace period, and a diode modulator means coupled to said controllable switch for influencing the amplitude of the generated deflection current during the trace period as a function of a modulation signal without influencing the d.c. voltage, generated by the circuit said diode modulator comprising a first diode adapted to cooperate with the deflection coil, a modulator coil adapted to be coupled to said deflection coil, a second diode coupled to said modulator coil, and a controllable switching device conductive in a first portion of the trace period of the deflection current coupled in parallel with the second diode with the opposite direction of conduction thereto.

4,182,979

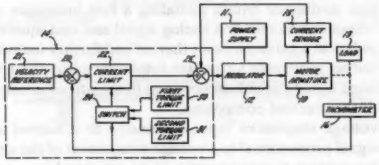
D-C. ELECTRIC TORQUING SYSTEM

Robert L. Douglas, and William P. Jezo, both of Janesville, Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Feb. 3, 1978, Ser. No. 874,742

Int. Cl.[2] H02P *7/00*

U.S. Cl. 318—434 **6 Claims**



1. An electric torquing device comprising

(a) a d-c. motor for producing an output torque that varies in proportion to variations in the armature current,

(b) a power source for supplying d-c. current to said armature to produce an output torque,

(c) regulating means for maintaining said d-c. current at a relatively low level during the run-on stage of a torquing operation,

(d) sensing means responsive to a preselected parameter of the torquing operation for producing a control signal when the tightening stage of the torquing operation begins,

(e) and control means responsive to the control signal from said sensing means for adjusting the regulation of said d-c. current to maintain the current supply to said armature at a relatively high level during the tightening stage of the torquing operation, said control means including

(1) torque reference signal generating means for producing a signal representing a torque limit for the tightening stage of the torquing operation,

(2) armature current sensing means for producing a signal representing the actual magnitude of the armature current during the torquing operation,

(3) said regulating means being responsive to said torque limit reference signal and said actual armature current signal for supplying current to the motor armature during the tightening stage at a magnitude proportional to the difference between said torque reference signal and said actual armature current signal to increase the actual torque output of the motor,

(f) and terminating means for de-energizing the motor in response to a preselected parameter of the torquing operation.

4,182,980

METHOD AND APPARATUS FOR CONTROLLING AUTOMATIC EQUIPMENT FOR SPRAYING COATING PRODUCTS

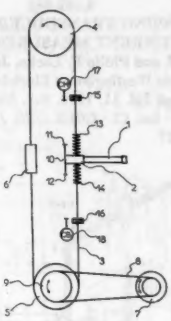
Roger Tholome, Corenc Montfleury, France, assignor to Air Industrie, Courbevoie, France

Filed May 17, 1976, Ser. No. 686,874

Claims priority, application France, Jun. 17, 1975, 75 19297

Int. Cl.[2] H02P *1/04, 3/00, 7/00*

U.S. Cl. 318—467 **18 Claims**



1. A method for controlling the displacement of a reciprocating unit from one end to another of a path of travel and driven by an electric motor energized from an electrical supply, which method comprises:

positively driving the reciprocating unit between two predetermined points intermediate the ends of the path of travel; and

adjacent each point,

cutting off the electrical supply to said motor when the reciprocating unit is in the vicinity of one of said points and is moving in a direction away from the other of said points;

then slowing the reciprocating unit with an elastic device and thereby coverting kinetic energy of said reciprocating unit into potential energy stored in said elastic device;

returning the reciprocating unit to the vicinity of said one predetermined point with the potential energy stored in said elastic device thereby converting the potential energy of the elastic device into kinetic energy of the reciprocating unit;

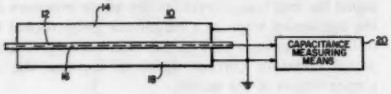
then reconnecting the electrical supply to said motor; and

positively driving the reciprocating unit towards the other predetermined point.

4,182,981
APPARATUS FOR GAUGING THE SHAPE OF A CONDUCTING SURFACE

Lanson Y. Shum, Greensburg, and James N. Brecker, Mt. Lebanon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 8, 1977, Ser. No. 858,861
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—61 R **11 Claims**

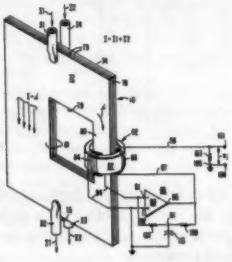


1. An apparatus for gauging the shape of an electrically conductive specimen surface, said apparatus comprising:
an electrically conductive reference surface of known shape;
a capacitance pad having a plurality of transversely separated electrodes disposed in a single layer between two layers of electrical insulation, said pad being insertable between and contactible with said specimen surface and said reference surface; and
means for measuring the capacitance of each electrode in said capacitance pad to establish the distances separating said reference surface from said specimen surface.

4,182,982
CURRENT SENSING TRANSDUCER FOR POWER LINE CURRENT MEASUREMENTS

Joachim E. Wolf, and Philip F. Locke, Jr., both of Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 11, 1978, Ser. No. 923,620
Int. Cl.[2] G01R *1/20, 19/00*
U.S. Cl. 324—127 **4 Claims**

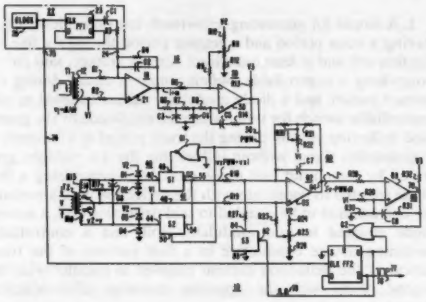


1. A current sensing transducer comprising: a conductive current divider having opposite terminal ends for series connection to a current component to be sensed, said current divider including two conductive members in mutually insulated relationship with each of said members having opposite terminal ends for separate series connection to two line currents defining said current component to be sensed, each of said conductive members further having a major current path and a branch current path for conducting a fractional current having a predetermined proportional value relative to one of said separate line currents; a compensated transformer including a magnetic core magnetically resonsive to said fractional current of each branch current path so that each branch current path forms a primary winding thereof, and further including first and second secondary windings inductively coupled to said magnetic core; amplifier means including an input responsive to an output of said first secondary winding and further including an output connected to said second secondary winding so as to control current supplied to said second secondary winding for producing a compensating magnetic flux substantially opposing a flux induced into said magnetic core by each fractional current in response to line current flow through each of said two conductive members of said current divider; and output terminal means responsive to said current supplied to said second secondary winding for producing a current responsive analog signal representative of said current component to be sensed.

4,182,983
ELECTRONIC AC ELECTRIC ENERGY MEASURING CIRCUIT

Theodore M. Heinrich, Murrysville, and Joseph J. Zelezniak, Wilkinsburg Boro., both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 11, 1978, Ser. No. 923,530
Int. Cl.[2] G01R *21/06*
U.S. Cl. 324—142 **11 Claims**

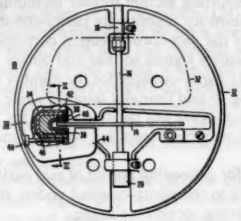


1. An AC electric energy measuring circuit comprising:
a current responsive input for receiving a first analog signal being responsive to the time derivative of a current component of an alternating current energy quantity to be measured;
a source of square wave pulses including a frequency substantially greater than the frequency of said alternating current energy quantity to be measured;
a first modulator circuit including a first integrator circuit responsive to said first analog signal and said square wave pulses at a common input thereof and further including an output producing a constant amplitude pulse width modulated signal variable in response to variations in amplitude of said current component;
a voltage responsive input responsive to a second analog signal proportional to a voltage component of the alternating current energy quantity to be measured;
a multiplier circuit including a second modulator circuit responsive to said second analog signal and to said constant amplitude pulse width modulated signal so as to produce a variable amplitude pulse width modulated signal corresponding to the product of said current and voltage components so that the average value thereof is representative of a measure of average power produced by said voltage and current components; and
an analog to frequency converter circuit including a second integrator circuit responsive to said variable amplitude pulse width modulated signal so as to produce output pulse signals, wherein each output pulse represents a quantized amount of said alternating current energy quantity to be measured.

4,182,984
MAGNETIC DAMPING ASSEMBLY WITH TEMPERATURE COMPENSATOR FOR WATTHOUR METERS

John A. MacFadden, and James E. Ramsey, both of Raleigh, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 5, 1978, Ser. No. 903,324
Int. Cl.[2] G01R 1/14, 11/10
U.S. Cl. 324—152 17 Claims



1. A magnetic damping asembly for watthour meters having a rotatable electroconductive disc, comprising:

a U-shaped magnetic yoke member having oppositely disposed legs extending over opposite sides of the path of rotation of the meter disc;

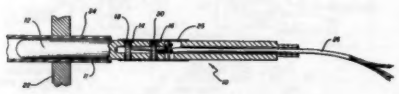
a pair of permanent magnets extending from the inner sides of said yoke member so that opposing pole faces thereof have a predetermined spaced relationship for receiving the disc and directing a braking magnetic flux into the disc; and

a temperature compensator means extending over said pole faces of said permanent magnets and forming a continuous shunt flux path therebetween so that divided portions of magnetic flux from said pole faces are directed either through said hunt flux path or through the space between said pole faces.

4,182,985
MAGNETORESISTOR BRIDGE PROBE FOR LOCATING THE POSITION OF A MAGNETIC TUBE SUPPORT SHEET OF A NONMAGNETIC HEAT EXCHANGE CONDUIT

Douglas DeWolfe, East Syracuse; Richard A. Sturley, Kirkville, and Francis E. McPhilmy, Chittenango, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 14, 1978, Ser. No. 896,402
Int. Cl.[2] G01R 33/12
U.S. Cl. 324—220 1 Claim



1. Apparatus for locating the position of a magnetic tube support sheet relative to a nonmagnetic heat exchange conduit comprising:

a source of electrical energy;

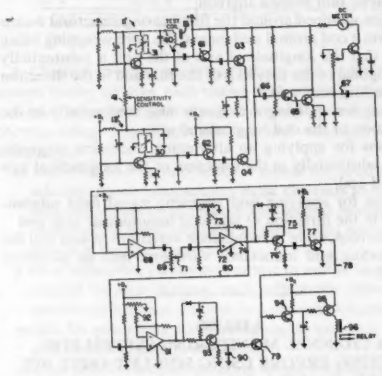
a probe assembly axially movable within said heat exchange conduit relative to said magnetic tube support sheet, and including a nonmagnetic head having a pair of axially spaced permanent magnets mounted thereon, with each magnet having a variable resistor connected thereto, the resistance of each resistor varying directly with the strength of the flux field emanating from each magnet, each resistor being connected together in a bridge circuit to said source of electrical energy for providing an electrical control signal the magnitude of said control signal varying in response to axial movement of said probe assembly including said magnets and said resistors relative to said magnetic tube support sheet; and

monitoring means for receiving said control signal and providing readout means for indicating the position of said tube support sheet relative to said heat exchange conduit, said monitoring means including a meter having a pointer movable in a first direction when the probe assembly is axially moved for locating a first one of said resistors in relatively close proximity to said tube support sheet and movable in an opposite direction when the probe assembly is further axially moved for locating the other of said resistors in relatively close proximity to said tube support sheet, said pointer being located at the center of said meter when said resistors are spaced equidistant from said tube support sheet.

4,182,986
TEST, CONTROL AND GAUGING METHOD USING LOCKED OSCILLATORS

Edward I. Parker, 34 Oak Ridge Rd., Holden, Mass. 01520

Continuation of Ser. No. 734,524, Oct. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 571,949, Apr. 28, 1975, Pat. No. 3,987,649, which is a continuation-in-part of Ser. No. 447,965, Mar. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 360,636, May 16, 1973, Pat. No. 3,910,074. This application Aug. 11, 1978, Ser. No. 932,927
Int. Cl.[2] G01R 33/12
U.S. Cl. 324—236 1 Claim



1. The method of testing metal parts for incremental variation in one or more of the properties of size or shape, mass, voids, composition or hardness comprising the steps of:

coupling oscillatory energy between two like tuned oscillators to synchronize said oscillators in frequency with the phase angle between the like frequency oscillations determined as a function of the tuning of said oscillators;

bringing parts subject to incremental variation in one of said properties into regularly ordered association with one of said oscillators so as to influence the tuning thereof, said influence being invariant for said association of parts having no incremental variation of said properties;

establishing a predetermined phase angle between said oscillators for the condition of tuning influenced by a part having no incremental variation of said properties;

detecting a signal which varies in accordance with the phase angle between said oscillators;

discriminating between detected signals representing phase angle variation caused by said bringing parts into regularly ordered association with one of said oscillators from signals caused by said incremental variation; and

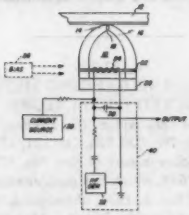
utilizing said detected signals after said discriminating as an indicator of absence or presence of said incremental variation in said one property.

4,182,987

MAGNETOMETER EMPLOYING HARD AXIS THIN FILM INDUCTOR

Charles R. Moeller, Cardiff-by-the-Sea, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 835,105, Sep. 21, 1977, Pat. No. 4,136,371.
This application Aug. 28, 1978, Ser. No. 937,283
Int. Cl.[2] G11B 5/34
U.S. Cl. 324—249 **1 Claim**



1. Apparatus for producing an electrical signal corresponding to a magnetic signal field comprising:

(a) structural means having an essentially single domain magnetic film formed thereon;

(b) a wire wrapped around the film bearing structural means to form a coil around said means, the wire wrapping being such that the longitudinal axis of the coil is substantially orthogonal to the easy axis of the film and in the direction of the film hard axis;

(c) means for applying a magnetic bias substantially in the direction of the coil longitudinal axis;

(d) means for applying an alternating excitation magnetic field substantially in the direction of the longitudinal axis of said coil;

(e) means for applying said magnetic signal field substantially in the direction of said coil longitudinal axis; and

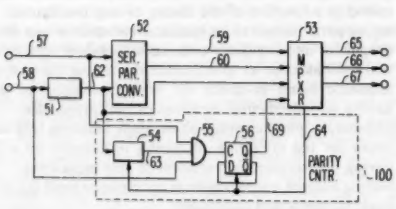
(f) means responsive to inductance variations in said coil for converting said inductance variations into an electrical signal.

4,182,988

PCM CHANNEL MONITORING SYSTEM FOR DETECTING ERRORS USING SINGLE PARITY BIT

Masatoshi Murakami, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 833,613, Sep. 15, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,601
Claims priority, application Japan, Sep. 17, 1976, 51-112132
Int. Cl.[2] H04B 1/00
U.S. Cl. 325—41 **4 Claims**



4. In a channel monitoring system for detecting a bit error in transmission channel between a transmitting section and a receiving section by the use of parity signals added to n series of binary codes (n being a positive integer equal to or greater than 2) divided into a plurality of monitoring sections having a time slot interval equal to each other, said transmitting section including means for converting said n series of binary codes into n series of differential binary codes across an arbitrary equal time slot interval shorter than the interval of the monitoring section, an N-phase modulator (N being equal to 2^n) for phase-modulating a carrier wave with said n series of differential binary codes, and means for transmitting said modulated carrier wave the improvements characterized by:

(a) said transmitting section further including:

(1) first means for repetitively parity-counting said binary codes of the monitoring section corresponding to each of said parity signals so that said binary codes are continuously parity-counted for the number of codes corresponding to said time slot interval while the subsequent binary codes are not parity-counted for the same number of codes corresponding to said time slot interval; and

(2) means for generating one bit of said parity signal corresponding to the parity-counted codes; and

(b) said receiving section including:

(1) means for deriving said binary codes from said modulated carrier wave;

(2) second means for counting the binary codes corresponding to the binary codes parity-counted at the transmitting section among the output codes of the deriving means; and

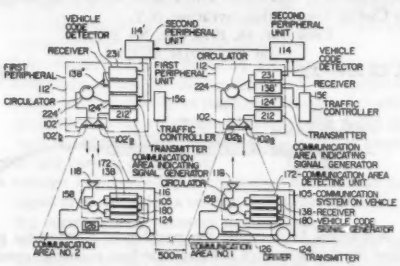
(3) means for comparing the counted content of said second counting means with said one bit of parity signal with respect to each of said monitoring sections to thereby detect a bit error.

4,182,989

SYSTEM FOR ESTABLISHING A COMMUNICATION LINK BETWEEN A GROUND STATION AND EACH OF VEHICLE DRIVERS WITHIN A LIMITED COMMUNICATION AREA

Hiroshi Endo, Yokosuka, and Kosaku Baba, Yokohama, both of Japan, assignors to Nissan Motor Company, Inc., Yokohama, Japan

Continuation of Ser. No. 735,746, Oct. 26, 1976, abandoned.
This application Jul. 7, 1978, Ser. No. 922,660
Claims priority, application Japan, Oct. 24, 1975, 50/127518
Int. Cl.[2] H04B 1/00
U.S. Cl. 325—53 **12 Claims**



1. A system for establishing a communication link between a vehicle driver (126) on a vehicle (116) and a base station via a plurality of peripheral units electrically connected thereto,

each of said peripheral units comprising: a first UHF antenna (102) which has a sharp directional characteristic, and is fixed at a support over a traffic road (103) facing the same; a first communication unit (112) which is connected to said first UHF antenna and includes at least one of a transmitter (124') or a receiver (138'); and an audio means which is connected to said first communication unit and

converts a voice into a corresponding electrical audio signal when said peripheral unit comprises a transmitter, and converts an electrical audio signal into a voice when said peripheral unit comprises a receiver, and which converts a voice into a corresponding electrical signal and vise versa when said peripheral unit comprises both a transmitter and a receiver,

said vehicle mounting thereon: a second UHF antenna (**118**) which has a sharp directional characteristic and directs upwards; a second communication unit (**105**) which is connected to said second UHF antenna and includes at least one of the other of a transmitter (**124**) or a receiver (**138**); and another audio means which is connected to said second communication unit and converts a voice into a corresponding electrical signal when said vehicle comprises a transmitter, and converts an electrical audio signal into a voice when said vehicle comprises a receiver, and which converts a voice into a corresponding electrical signal and vice versa when said vehicle comprises both a transmitter and a receiver,

said transmitters including, means (**132**) for compressing the electrical audio signal at a predetermined ratio with respect to time, and means (**136**) for modulating UHF carrier by the compressed audio electrical signal, the modulated UHF signal being fed to at least one of said first and second UHF antenna in order to be radiated therefrom, and

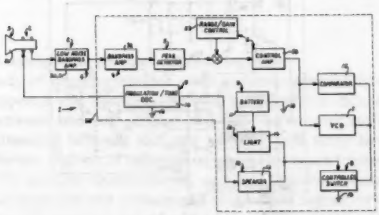
said receivers including, means (**146**) for detecting the compressed audio electrical signal from the modulated UHF signal, and means (**150**) for reproducing the audio electrical signal from the compressed audio electrical signal, whereby said communication link is established through one of said first UHF antenna and said second UHF antenna within a limited communication area defined by each of said first UHF antennas.

4,182,990

RADAR RECEIVER AND METHOD OF INDICATING RANGE TO A RADAR SOURCE

Calvin B. Coffin, and Richard M. Christmann, both of Wichita, Kans., assignors to Interstate Electronics Supply, Inc., Wichita, Kans.

Filed May 19, 1978, Ser. No. 907,510
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—364 **14 Claims**



1. In a microwave receiver having front end means providing an amplified signal proportional in level to the strength of received microwave energy, the improvement comprising:

(a) peak detector means connected to said front end means and having an output providing a DC peak signal proportional in level to said amplified signal;

(b) a voltage controlled oscillator (VCO) having a frequency control input connected to said peak detector means output, the frequency of a VCO signal from an output of said VCO being determined by the level of said peak signal;

(c) an alarm power source;

(d) an alarm output device; and

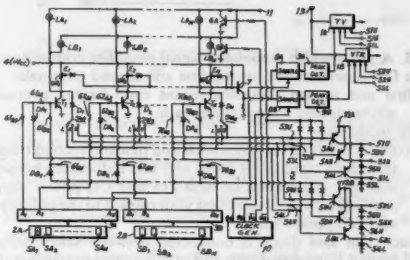
(e) controlled switch means having a control terminal connected to the output of said VCO and having a pair of switch terminals, said alarm power source being connected to one of said switch terminals, said alarm output device being connected to the other of said switch terminals, said VCO effecting periodic conduction between said switch terminals, and said alarm power source transferring activating power to said alarm output device during said conduction between said switch terminals.

4,182,991

CHANNEL SELECTING APPARATUS FOR USE WITH PLURAL TUNING DEVICES

Toshio Amano, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 16, 1978, Ser. No. 934,040
Claims priority, application Japan, Aug. 17, 1977, 52-98552
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—459 **17 Claims**



1. Channel selecting apparatus for use with at least first and second tuning devices, each tuning device being responsive to a channel selecting signal supplied thereto for being tuned to a corresponding frequency, said channel selecting apparatus comprising:

at least first and second selector means for producing first selector signals representing those channels to which said first tuning device is tunable and second selector signals representing those channels to which said second tuning device is tunable, respectively;

a set of adjustable elements common to said at least first and second turning devices, each adjustable element being settable to produce a respective channel selecting signal;

means for generating a switching signal having at least first and second phases in sequence;

at least first and second sampling means associated with said at least first and second tuning devices, respectively, said first sampling means being responsive to the first phase of said switching signal to sample a channel selecting signal applied thereto, and said second sampling means being responsive to the second phase of said switching signal to sample a channel selecting signal applied thereto;

a set of switch means, each being coupled to a respective one of said adjustable elements and to receive a respective first selector signal and a respective second selector signal, each switch means being conditioned by said first phase of said switching signal to enable the channel selecting signal produced by the adjustable element coupled thereto to be applied to said first sampling means if a first selector signal is supplied thereto, and each switch means being conditioned by said second phase of said switching signal to enable the channel selecting signal produced by said adjustable element coupled thereto to be applied to said second sampling means if a second selector signal is supplied thereto; and

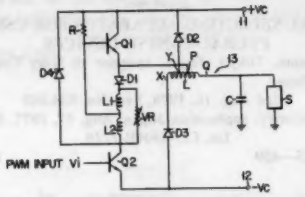
means for applying the channel selecting signals sampled by said at least first and second sampling means to said at least first and second tuning devices, respectively.

4,182,992

PULSE WIDTH MODULATED SIGNAL AMPLIFIER

Brian E. Attwood, Sestri 49, Smithbarn Horsham, Sussex RH13 6DS, England

Filed Apr. 14, 1978, Ser. No. 896,243
Claims priority, application Japan, Apr. 15, 1977, 52-43399; Apr. 22, 1977, 52-45998; Apr. 22, 1977, 52-50398[U]
Int. Cl.[2] H03F *3/38*
U.S. Cl. 330—251 7 Claims



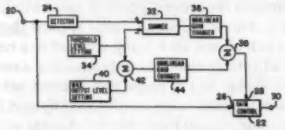
1. A pulse width modulated signal amplifier comprising:
a DC power source having first and second terminals;
first and second transistor means each having a control electrode and a conduction path;
an inductance;
a diode connected in series with said first and second transistor means conduction paths and said inductance between said first and second terminals of said DC power source and in the forward direction with respect to the polarity of said DC power source
such that said diode is connected between said first and second transistor means and said inductance is connected between said diode and said second transistor means;
a lowpass filter having a choke coil and connected between a load and a junction of said first transistor means and said diode;
first connection means connecting a point of said inductance to said control electrode of said first transistor means;
second connection means connecting said control electrode of said first transistor means to said first terminal means of said DC power source; and
means for applying a pulse width modulated signal to be amplified to said control electrode of said second transistor means.

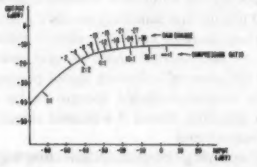
4,182,993

SIGNAL AMPLITUDE COMPRESSION SYSTEM

Leslie B. Tyler, Newtonville, Mass., assignor to DBX Inc., Newton, Mass.

Filed Nov. 2, 1978, Ser. No. 957,307
Int. Cl.[2] H03G *3/10*
U.S. Cl. 330—279 27 Claims





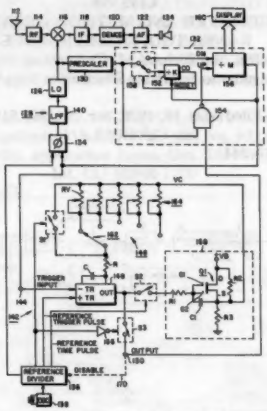
13. A signal compression system for providing a compressed electrical output signal in response to an electrical input signal when the level of said input signal exceeds a predetermined threshold level, said system comprising:
means for establishing a preselected maximum signal level of said output signal so that said system provides substantially infinite compression of said input signal when said output signal substantially equals said maximum signal level;
means for varying said predetermined threshold level;
means, responsive to said means for varying said predetermined threshold level, for generating a gain adjustment signal as a function of the difference between (1) said maximum signal level, and (2) the level of said ouput signal when the level of said input signal equals said threshold level; and
gain control means, including means at least in part responsive to said gain adjustment signal, for compressing said input signal in accordance with a predetermined gain control function, said gain control function providing substantially infinite compression of said input signal when the signal level of said output signal substantially equals said maximum signal level regardless of said difference.

4,182,994

PHASE LOCKED LOOP TUNING SYSTEM INCLUDING STABILIZED TIME INTERVAL CONTROL CIRCUIT

Felix Aschwanden, Thalwil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Jul. 17, 1978, Ser. No. 925,655
Claims priority, application United Kingdom, Aug. 22, 1977, 35167/77
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—1 A 9 Claims



1. Apparatus comprising: controlled oscillator means for generating a controlled oscillator signal having a frequency determined by a control signal;
programmable divider means for dividing the frequency of said controlled oscillator means by a programmable factor N to generate a frequency divided controlled oscillator signal having one pulse for every N cycles of said controlled oscillator signal;
reference means including a relatively stable oscillator for generating a frequency reference signal;
phase comparator means for generating said control signal in accordance with the phase and frequency relationship between said frequency divided controlled oscillator signal and said frequency reference signal;

triggerable means for generating output pulses in response to input pulses, said triggerable means including time constant means for determining the duration of said output pulses, said triggerable means generating normal output pulses in response to said pulses of frequency divided controlled oscillator signal;

programmable factor control means for controlling said programmable factor N in accordance with the duration of said normal pulses generated by said programmable divider means;

said reference means also generating reference trigger and time reference pulses in a substantially fixed time relationship in the time interval between successive ones of said normal output pulses, said triggerable means generating comparison output pulses having a predetermined duration in response to said reference trigger pulses, said fixed time relationship being related to the nominal value of the predetermined duration of said comparison output pulses; and

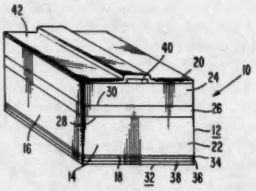
comparison means for generating an error signal in response to said comparison output pulses and said time reference pulses representing the deviation between the duration of said comparison output pulses and said fixed time relationship, said time constant means being responsive to said error signal to reduce said deviation.

4,182,995

LASER DIODE WITH THERMAL CONDUCTING, CURRENT CONFINING FILM

Frank Z. Hawrylo, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,365
Int. Cl.² H01S 3/19
U.S. Cl. 331—94.5 H **5 Claims**



1. A semiconductor laser diode comprising:

a body of single crystalline semiconductor material having opposed end surfaces, opposed side surfaces extending between said end surfaces and opposed contact surfaces extending between said end surfaces, said body having therein regions of opposite conductivity types forming a PN junction therebetween, said PN junction extending between said end surfaces and each of said regions extending to a separate one of said contact surface with at least a portion of each of said regions which extends to said contact surface being of indium phosphide,

a first conductive layer on one of said contact surfaces and forming an ohmic contact with the semiconductor body,

a second conductive layer on the other of said contact surface and forming an ohmic contact with the semiconductor body, said second conductive layer being in the form of a stripe extending between said end surfaces and spaced from the side surfaces, and

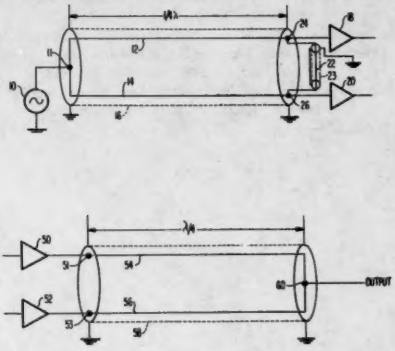
a film of germanium on the portions of the other contact surface between the second conductive layer and the side surfaces, said germanium film forming a blocking contact with the indium phosphide portions of the semiconductor body.

4,182,996

MAGNETIC R.F. POWER SPLITTER AND POWER COMBINER

Lewis C. Spence, 948 Ave. East, Rivera Beach, Fla. 33404

Filed Mar. 9, 1978, Ser. No. 884,936
Int. Cl.² H01P 5/12
U.S. Cl. 333—100 **12 Claims**



1. A power splitter for dividing radio frequency power applied to an input terminal equally among n output terminals, where $n \geq 2$ and is an integer, comprising:

(a) housing means being physically equal to λ/4 at the center frequency f of said power splitter for providing a λ/4 electromagnetically shielded volume having first and second openings;

(b) n separate inner conductors, each said inner conductor having a physical length equal to λ/4 at the center frequency f and having first and second ends;

(c) means for mounting each said inner conductor in said electromagnetically shielded volume whereby said inner conductors are electrically insulated from each other and from said housing means and said first end of each said inner conductor is at said first opening and said second end of each said inner conductor is at said second opening;

(d) said input terminal defined by electrically connecting together each said first end at said first opening and by electrically insulating said first ends from said housing; and

(e) (n−1) separate electromagnetically shielded λ electrical lines (tuned for the center frequency f), each said λ line having a center conductor and a shield conductor, said shield conductor of each said λ line being electrically connected to said housing means, the center conductor of each said λ line being disposed between and electrically connecting together a separate pair of said second ends of said inner conductors so as to form an electrical ring with one such λ line missing between one of said pairs, whereby each of said second ends is an output terminal.

7. A power combiner for summing radio frequency power applied to n input terminals, where $n \geq 2$ and is an integer, to an output terminal, comprising:

(a) housing means being physically equal to λ/4 at the center frequency f of said power combiner for providing a λ/4 electromagnetically shielded volume having first and second openings;

(b) n separate inner conductors, each said inner conductor having a physical length equal to λ/4 at the center frequency f and having first and second ends;

(c) means for mounting each said inner conductor in said electromagnetically shielded volume whereby said inner conductors are electrically insulated from each other and from said housing means and said first end of each said inner conductor is at said first opening and said second end of each said inner conductor is at said second opening; and

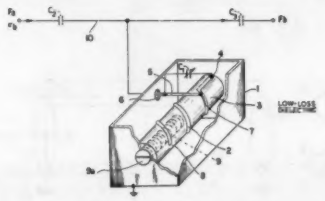
(d) said output terminal defined by electrically connecting together each said second end at said second opening and by electrically insulating said first ends from said housing, whereby each of said first ends is an output terminal.

4,182,997

BAND-PASS/BAND-STOP FILTER FOR TELECOMMUNICATION SYSTEM

Giuliano Brambilla, Milan, Italy, assignor to Societe Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Dec. 15, 1977, Ser. No. 860,835
Claims priority, application Italy, Dec. 16, 1976, 30456 A/76
Int. Cl.[2] H03H 7/10, 7/16; H01P 7/06
U.S. Cl. 333—175 **10 Claims**



1. A band-pass/band-stop filter adapted to suppress a first signal frequency F_a and to pass without significant attenuation a second signal frequency F_b, comprising:

a conductive coil wound on a hollow dielectric core, said coil having a grounded first end and an unconnected second end;

an input lead connected to said coil at a tap between said ends, said tap defining with said first end a grounded coil portion constituting a first inductance and with said second end an ungrounded coil portion constituting a second inductance;

a conductive rod extending partly into said core in the vicinity of said first end and forming a distributed-constant capacitance with said ungrounded coil portion, said distributed-constant capacitance and said first inductance together constituting a series-resonant circuit tuned to said first frequency F_a; and

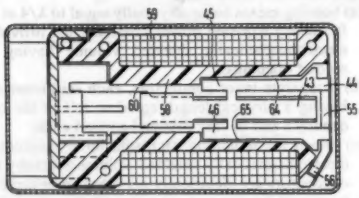
a lumped-constant capacitor connected between said input lead and ground, said lumped-constant capacitor and said second inductance forming part of a parallel-resonant circuit tuned to said second frequency F_b.

4,182,998

EXTERNALLY ADJUSTABLE ELECTROMAGNETIC RELAY

Erwin Mueller, Munich, and Gunther Schwab, Neuried, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 10, 1978, Ser. No. 904,598
Claims priority, application Fed. Rep. of Germany, May 23, 1977, 2723219
Int. Cl.[2] H01H 51/27
U.S. Cl. 335—151 **13 Claims**



1. In an electromagnetic relay having a housing with a flexible switching element mounted therein, the switching element attached at one of its two ends to an elongated ferromagnetic adjusting plate, another of the switching element ends cooperating with a second contact element carried by the housing to form an electrical connection, the ferromagnetic adjusting plate being pivotable within the housing by application of an externally applied magnetic field, the ferromagnetic plate carried by the housing, the improvement of the ferromagnetic plate being suspended from the housing through torsion bar means, the torsion bar means forming at least one swivel axis about which the ferromagnetic adjusting plate is pivotable under the influence of the externally applied magnetic field, the torsion bar means being formed of a material which is bendable to a new positional state upon torsional rotation under application of the external magnetic field.

4,182,999

REED SPRING RELAY CONSTRUCTION

Edward G. Walsh, Galena, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 11, 1978, Ser. No. 904,973
Int. Cl.[2] H01H 1/66
U.S. Cl. 335—151 **10 Claims**

1. An electrical relay construction comprising a winding bobbin having a cavity along its longitudinal axis, said cavity opening at each end in a substantially pyramidal socket, a pair of reed spring members each having a contact end and a terminal end, and a substantially pyramidal sleeve, having the same dimensions as said socket fitted about each of said spring members near said terminal end, said sleeves being fitted in said sockets to position said spring members within said bobbin cavity in an overlapping relationship at said contact ends, said spring members being aligned at slight opposite angles from the longitudinal axis of said cavity to present a contact gap at said contact ends of said spring members.

4,183,000

ELECTROMAGNETIC SAFETY MECHANISM

Franz J. F. Storez, Brussels, Belgium, assignor to Saunier Duval, Rueil Malmaison, France

Filed Nov. 25, 1977, Ser. No. 854,839
Claims priority, application France, Nov. 30, 1976, 76 36021
Int. Cl.[2] H01F 7/08
U.S. Cl. 335—263 **8 Claims**

1. An electromagnetic fuel valve solenoid comprising:

a housing;

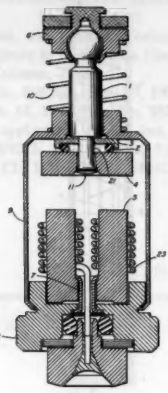
in said housing, a fixed magnet provided with an energizing winding;

an operating shaft slidable axially through a bore in said housing;

at one end of said shaft, an armature which cooperates with said magnet for actuating said shaft upon energization of said winding, said armature being loosely attached to said shaft for permitting said armature to self-align with said magnet; and

between said armature and a corresponding surface of said shaft, a resilient washer which is normally under slight

compression and which moves in its entirety with the armature and shaft upon energization of the fixed magnet

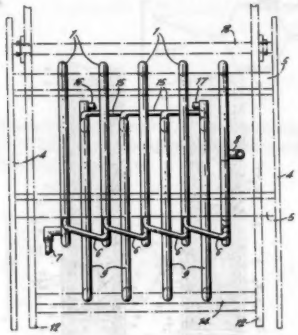


for inhibiting relative movement and wear between said shaft and said armature.

4,183,001
TRANSFORMERS FOR INDUCTION HEATING EQUIPMENT

David S. Brooks, Sheperton, and Trevor C. Savage, Caterham on the Hill, both of England, assignors to Electroheating (London) Limited, London, England

Continuation of Ser. No. 808,546, Jun. 21, 1977, abandoned.
This application Dec. 22, 1978, Ser. No. 972,460
Int. Cl.[2] H01F *21/04, 27/28*
U.S. Cl. 336—62 **8 Claims**

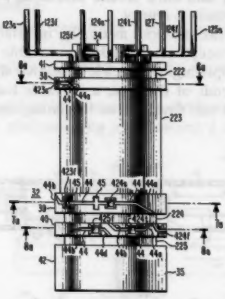


1. A fluid-cooled transformer for induction heating equipment, said transformer comprising a tubular primary coil and a tubular secondary coil having parallel axes and including means for passing a cooling fluid through said tubular coils, each coil having a support structure comprising end plates joined together in spaced relation by cross-pieces and a plurality of loops or turns mounted on said support structure, each of said loops or turns being a length of tubing sealed at at least one end and bent until its ends lie adjacent to and spaced from each other, the support structure of one of said coils having its end plates mounted on a spindle which extends parallel to and is equally spaced from the axes of both coils and is rotatable about its axis to move said coil relative to the other to shift its axis towards and away from the axis of the other, said loop or turn of one coil being displaced axially relative to those of the other coil with the turns of one coil alternating, in an axial direction, with the turns of the other so that a loop or turn of one coil can pass between two adjacent loops or turns of the other when said one coil is moved relative to the other.

4,183,002
WINDING STRUCTURE

Horst E. Haslau, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 26, 1978, Ser. No. 909,627
Int. Cl.[2] H01F *15/10, 27/30*
U.S. Cl. 336—192 **11 Claims**



1. A winding structure comprising:
a bobbin;
at least a first winding channel situated adjacent an outer surface of said bobbin, at least a first conductor winding unit about said first winding channel, said first winding unit including at least a first conductor termination segment located at a first predetermined longitudinal position along a longitudinal axis of said bobbin and at a first predetermined angular position about said longitudinal axis;
at least a first longitudinal connecting conductor located inwardly of said outer surface and traversing at least a portion of said bobbin in a direction generally along said longitudinal axis;
a winding channel shoulder located in the vicinity of said first predetermined longitudinal position;
at least a first passageway located in said shoulder adjacent said first predetermined angular position providing access to said first longitudinal connecting conductor;
at least one guide track located in said shoulder connecting said first passageway to said first winding channel guiding a conductor portion of said first winding unit from said first winding channel to said passageway for emplacing said first conductor termination segment; and
first electrical interconnecting means located in said first passageway providing electrical connection between said first conductor termination segment and said first longitudinal connecting conductor.

4,183,003
LOAD-BREAK FUSE EQUIPMENT

Lewis C. Cleveland, and Howard W. Smith, both of Conover, N.C., assignors to General Electric Company, Philadelphia, Pa.

Filed Jun. 16, 1978, Ser. No. 916,408
Int. Cl.[2] H01H *71/20*
U.S. Cl. 337—156 **7 Claims**

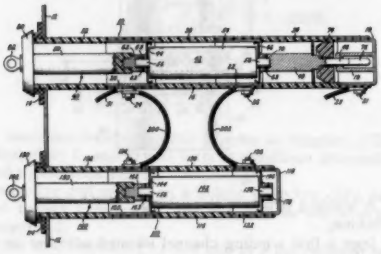
1. In combination,
(a) a wall having two spaced-apart openings,
(b) two tubular receptacles having bores respectively generally aligned with said openings and each having one end secured to said wall and its opposite end spaced from the wall,
(c) each receptacle comprising: an outboard contact and an

inboard contact at axially-spaced locations along the bore of said receptacle, first tubular insulating structure insulating said contacts of a receptacle from each other when the receptacle is empty, and second tubular insulating structure insulating the outboard contact of a receptacle from said wall,

(d) one of said receptacles further comprising a third tubular insulating portion located axially inwardly of the inboard contact of said one receptacle,

(e) a generally stationary load-break contact at said opposite end of said one receptacle and insulated from said inboard contact by said third tubular insulating portion when said one receptacle is empty,

(f) a load-break drawout assembly, insertable as a unit into said one receptacle and also removable as a unit therefrom, comprising: an electric fuse, two sliding contacts at opposite ends of the fuse, a movable load-break contact inboard of said fuse, and an insulating drawout rod at the



outboard end of said fuse; said movable load-break contact engaging such stationary load-break contact, and said two sliding contacts respectively engaging said inboard and outboard contacts of said one receptacle when said drawout assembly is fully inserted,

(g) a non-load-break drawout assembly insertable into said other receptacle as a unit and also removable therefrom as a unit comprising: an electric fuse, two sliding contacts at opposite ends of the fuse, and an insulating drawout rod at the outboard end of said fuse; said two sliding contacts respectively engaging said inboard and outboard contacts of said other receptacle when said non-load-break drawout assembly is fully inserted,

(h) and means for electrically connecting said two fuses in parallel with each other and in series with said load-break contacts comprising a first conductor interconnecting the outboard contacts of the two receptacles and a second conductor interconnecting the inboard contacts of the two receptacles.

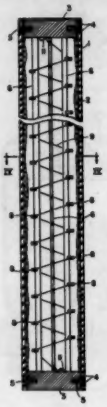
4,183,004

FUSE HAVING HELICALLY WOUND FUSIBLE ELEMENT AND SUPPORT THEREFOR

Frederick J. Kozacka, South Hampton, N.H., assignor to Gould Inc., Newburyport, Mass.

Filed Apr. 12, 1978, Ser. No. 895,536
Int. Cl.[2] H01H *85/38*
U.S. Cl. 337—273 **2 Claims**

1. An electric fuse including a tubular casing of electric insulating material, a pulverulent arc-quenching filler inside said casing, a pair of terminal elements closing the ends of said casing, a substantially helically wound fusible element conductively inter-connecting said pair of terminal elements, and a support of a laminate of glass-cloth and a synthetic resin for supporting said fusible element wherein the improvement comprises in that said support of a laminate of glass-cloth and a synthetic resin which evolves relatively small amounts of gas under the action of electric arcs has inserts including melamine and inorganic substances at the points of cross-over of said fusible element and said support, said inserts are capable of evolving relatively large amounts of gas under the action of electric arcs so that said fusible element and the electric arc



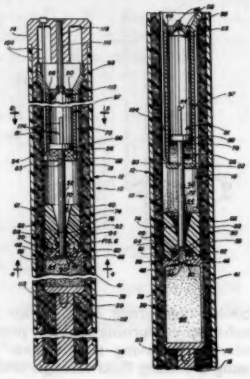
which takes its place are effectively insulated by said support in the absence of any ceramic insulating material.

4,183,005

CIRCUIT INTERRUPTING DEVICE

Otto Meister, Arlington Heights, and Thomas J. Tobin, Northbrook, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed May 24, 1978, Ser. No. 909,145
Int. Cl.[2] H01H *85/38*
U.S. Cl. 337—275 **61 Claims**



61. An improved circuit interrupting device of the type in which a flow of dielectric fluid is directed at an arc established between a pair of parting contacts, wherein the improvement comprises:

diaphragm means for normally preventing flow of the fluid; and

means for applying a tearing force to the diaphragm to permit fluid flow as the contacts part, the tearing force being applied in the same general direction as the fluid flows.

4,183,006

ORGANIC HEAT-SENSITIVE SEMICONDUCTIVE MATERIALS

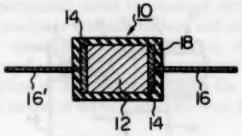
Mutsuaki Murakami, and Susumu Yoshimura, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Limited, Kadoma, Japan

Division of Ser. No. 805,342, Jun. 10, 1977. This application Oct. 18, 1978, Ser. No. 952,290

Claims priority, application Japan, Jun. 11, 1976, 51/69052; Jun. 11, 1976, 51/69053; Jun. 11, 1976, 51/69055

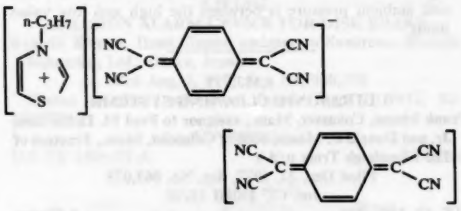
Int. Cl.[2] B32B 27/06; H01C 7/10

U.S. Cl. 338—23 11 Claims



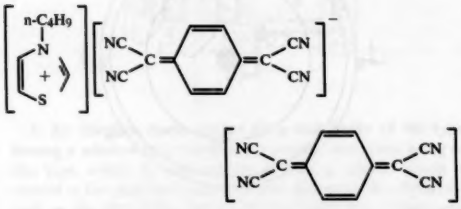
1. A heat-sensitive element comprising an organic heat-sensitive semiconductive material selected from the group consisting of:

(a) (N-n-propylthiazolium)+(7,7,8,8-tetracyanoquinodimethane)−(7,7,8,8-tetracyanoquinodimethane) expressed by the following formula



and

(b) (N-n-butylthiazolium)+(7,7,8,8-tetracyanoquinodimethane)−(7,7,8,8-tetracyanoquinodimethane) expressed by the following formula



4,183,007

ULTRASONIC TRANSCEIVER

James D. Baird, Naperville, Ill., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Feb. 22, 1978, Ser. No. 879,862

Int. Cl.[2] G01S 9/66; H04R 17/00

U.S. Cl. 367—119 4 Claims

1. In a liquid level gauge, the combination of an ultrasonic pulse generator, an ultrasonic pulse receiver and a transceiver coupled alternatively to said generator and to said receiver and capable of transmitting ultrasonic pulses through a gaseous medium toward the surface of the liquid to be gauged and of receiving ultrasonic echo pulses therefrom whereby the elapsed time between the transmission and reception of the pulses is indicative of the level of the liquid, said transceiver comprising:

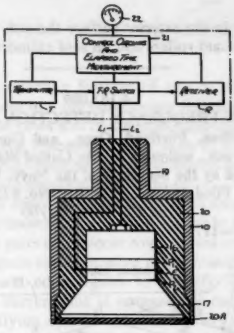
A. an open-ended casing; and

B. a transducer assembly suspended within said casing by an electrically non-conductive elastomeric material which fills said casing and serves to rapidly damp the vibratory activity of the assembly to prevent ringing thereof which interferes with the reception of the ultrasonic pulses, said assembly including:

(a) a piezoelectric transducer having upper and lower faces;

(b) a loading plate in contact with the upper face of said transducer;

(c) a radiating plate in contact with the lower face of the transducer, said radiating plate having a radiating face



adjacent the open end of said casing which is covered by said elastomeric material, said radiating plate being horn shaped and said radiating face thereof having a larger diameter than the diameter of the transducer to produce an ultrasonic beam having a narrow angle; and

(d) a bolt extending between said plates and passing through said transducer to compress said transducer to cause it to operate in the compression mode and thereby make it possible to drive the transducer with a high voltage to generate powerful ultrasonic pulses which tend to produce ringing, said ringing being damped rapidly by said elastomeric material, said transducer being formed by a pair of disc-shaped piezoelectric elements in polar opposition, with a planar electrode therebetween in contact with and common to the faces of said elements which are of one polarity, said plates being in contact with the faces of said elements of opposite polarity.

4,183,008

NOISE MAKING DEVICE

Ralph P. Crist, Harrisburg, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

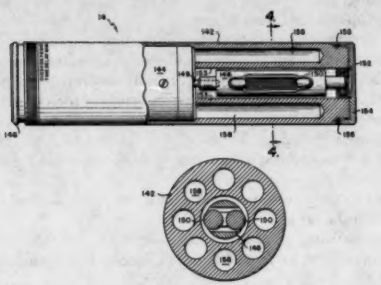
Division of Ser. No. 734,803, May 12, 1958. This application Oct. 11, 1961, Ser. No. 144,513

Int. Cl.[2] H04B 11/00

U.S. Cl. 367—142 4 Claims

4. An underwater noise generator comprising a thickwalled hollow cylindrical housing, said housing having continuous inner and outer cylindrical surfaces and at least one hollow portion between said inner and outer surfaces; a spindle rotatably mounted within said housing along the longitudinal axis thereof, means for rotating said spindle, and a roller mounted

on said spindle and driven thereby in rolling contact with said inner surface of said housing, said roller having a plurality of



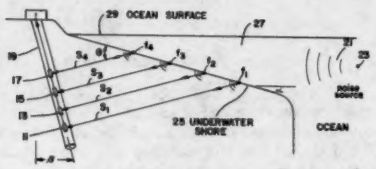
grooves cut in the exterior surface thereof, whereby sound is produced as said rollers roll on said cylindrical housing.

4,183,009

LOW FREQUENCY DETECTION SYSTEM

Paul F. Carlson, Portland, Oreg., and Gordon L. Mitchell, Seattle, Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 26, 1978, Ser. No. 872,415
Int. Cl.[2] H04B *11/00*
U.S. Cl. 367—117 **8 Claims**



1. The method of detecting low frequency sound in the range of from about 1 to about 100 Hz propagating in the ocean including the use of the earth, the sloping characteristic of the earth's underwater near shore, the tapered section of ocean above the near shore comprising the steps of:

(a) the sloping earth's underwater near shore coupling with the ocean and radiating beams of energy into the earth from predetermined positions, in predetermined directions and at discrete frequencies; and

(b) detecting said beams by a plurality of detectors tuned to said discrete frequencies and positioned in the earth at locations that are in the path of said radiating beams of energy.

4,183,010

PRESSURE COMPENSATING COAXIAL LINE HYDROPHONE AND METHOD

G. Kirby Miller, Saratoga, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.

Continuation-in-part of Ser. No. 638,540, Dec. 8, 1975. This application Mar. 14, 1977, Ser. No. 777,014
Int. Cl.[2] G01V *1/38*
U.S. Cl. 367—154 **5 Claims**

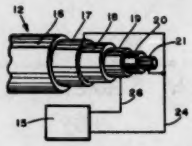
1. A hydrophone having first and second output terminals and adapted to produce an electrical signal across said terminals in response to application of a mechanical force thereto, said hydrophone comprising

a coaxial cable having first conductor means electrically connected to said first terminal and second conductor means electrically connected to said second terminal,

said first conductor means comprising outer and inner conductors spaced outwardly and inwardly, respectively, from said second conductor means, and

dielectric means comprising an electret disposed between said second conductor means and one of said conductors and a piezoid disposed between said second conductor means and the other of said conductors.

4. The method of detecting mechanical vibrations applied to the exterior of a coaxial cable transducer in high and low ambient pressures, said transducer having at least two radially spaced conductors and dielectric means between the conductors, said dielectric means having electret and piezoelectric properties, consisting of the steps of



measuring electrostatically generated signals across said conductors and the dielectric means when the ambient pressure is low,

measuring piezoelectrically generated signals across said conductors and dielectric means when said ambient pressure is high, and

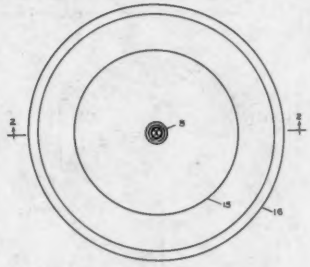
measuring electrostatically and piezoelectrically generated signals across said conductors and the dielectric means when said ambient pressure is between the high and low value limits.

4,183,011

ULTRASONIC CLEANING SYSTEMS

Frank Massa, Cohasset, Mass., assignor to Fred M. Dellorfano, Jr. and Donald P. Massa, both of Cohasset, Mass., Trustees of The Stoneleigh Trust u/d/t

Filed Dec. 22, 1977, Ser. No. 863,075
Int. Cl.[2] H04B *13/00*
U.S. Cl. 134—184 **8 Claims**



1. In combination in an electroacoustic transducer adapted for sonic cleaning the wall surface of a vessel whose area is large compared with the area of the transducer, a water-proof housing structure enclosing a vibratile transducer element, means for operating said vibratile element at alternating displacements of specified amplitude and frequency, means for transmitting said alternating displacements to an exposed surface of said housing structure, mounting means for supporting said transducer, said mounting means characterized in that said exposed vibratile surface of said transducer may be conveniently moved relative to the surface of said wall, spacing means associated with said exposed vibratile surface, said spacing means characterized in that it serves to keep the said exposed vibratile transducer surface in relatively close spaced

proximity to said wall surface as said transducer is moved relative to the surface of said wall, said spacing means including a perforated thin walled outer cover attached to said water proof housing structure and located opposite said exposed vibratile transducer surface whereby a confined space results between said perforated cover and said vibratile transducer surface, an inlet opening communicating into said confined space a reservoir of sound-conducting liquid, means for transferring a quantity of said liquid from said reservoir through said inlet opening to keep said space confined filled with said liquid as said transducer is moved relative to the surface of said wall, said sound transmitting liquid which fills said space characterized in that it slowly leaks from said confined space through said perforated cover to establish acoustic coupling between the transducer vibratile surface and said wall surface being cleaned, the amplitude and frequency of said vibratile exposed surface of said transducer being of such magnitude as to cause cavitation in the liquid which fills the space between said exposed transducer surface and said wall surface.

4,183,012

ABRASION ALARM DEVICE FOR DISK BRAKE

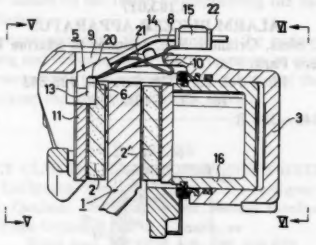
Ryoichi Kimura, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 2, 1978, Ser. No. 930,270

Claims priority, application Japan, Aug. 2, 1977, 52-104173[U]

Int. Cl.[2] B60T *17/22*

U.S. Cl. 340—52 A **5 Claims**



1. An abrasion alarm device for a disk brake of the type having a window hole in a floating caliper, said alarm being of the type which is mounted on a floating caliper which is moved in the axial direction of a brake disk to cause a frictional pad on one side of the disk to abut against a disk braking surface, and which gives an alarm upon excessive abrasion of the frictional pad, wherein the improvement is characterized in that said abrasion alarm device comprises:

a probe having an electric wire for generating an electrical signal through frictional engagement with the disk braking surface; and

a spring member having a depressing part adapted to elastically abut said probe in such a manner that said probe is moved away from said disk, said spring member being elastically locked with an edge of said window hole formed outside said disk and in said floating caliper by an elastically locking part of said spring member which acts in opposition to said depressing part.

4,183,013

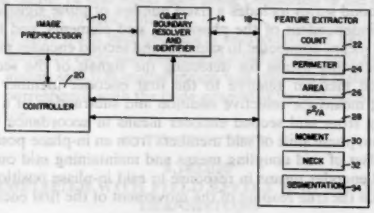
SYSTEM FOR EXTRACTING SHAPE FEATURES FROM AN IMAGE

Ashok K. Agrawala, Silver Springs, Md.; Ashok V. Kulkarni, Watertown, and Edwin H. Paul, Jr., Natick, both of Mass., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Nov. 29, 1976, Ser. No. 745,912

Int. Cl.[2] G06K *9/12*

U.S. Cl. 340—146.3 AC **116 Claims**



1. Method for extracting features of one or more objects against a background in a digitized image forming a multiple cell array having M rows and N columns, said objects having boundaries and being characterized by cells of a first binary state, and said background being characterized by cells of a second binary state, comprising the steps of:

A. scanning said array along said rows in a single pass and detecting and identifying edges of objects in a succession of contiguous pairs of adjacent rows of said image, generating edge signals representative thereof, and

B. processing said edge signals to identify segmentation features as a current line is scanned for each identified edge by identifying a portion of the boundary of the object associated with that identified edge as a primitive segment.

4,183,014

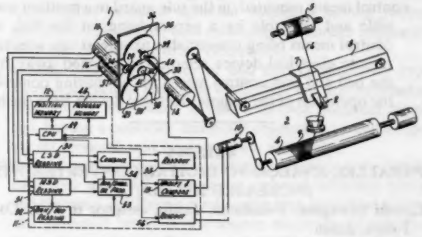
ABSOLUTE ENCODING APPARATUS

William G. McClean, Milwaukee, and Daniel C. Budge, Menomonee Falls, both of Wis., assignors to Tri-N Associates, Inc., Milwaukee, Wis.

Filed Jan. 21, 1977, Ser. No. 760,938

Int. Cl.[2] G08C *19/28, 9/06*

U.S. Cl. 340—204 **9 Claims**



9. In an absolute encoding apparatus comprising an energy source, a first encoder means having a relatively movable first encoder member including a plurality of energy-responsive portions distributed for alternate and cyclical coupling to the source for generating a first series of timed, spaced, pulse signals per cycle of movement; a second encoder means having a relatively movable second encoder member including a plurality of energy responsive portions distributed for alternate and cyclical coupling to said energy source for generating a second series of time-spaced pulse signals, coupling means

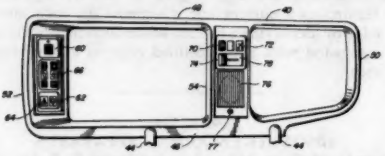
coupling said first and second encoder means to move said second encoder means through a reference position in a selected in-phase relation to a corresponding reference position of the first encoder member to generate a pulse signal for each plurality of pulse signals from said first encoder means, said second series being related to said first series in time in accordance with coupling means whereby the phase relation of said reference positions of said elements varies with offset in the coupling means, each adjacent pair of pulse signals of said second encoder means including a whole and same multiple of the pulse signals per cycle of the first encoder means whereby the second series includes a fixed number of pulse signals per cycle independent of the phasing of said elements, and logic circuit means connected to said first and second encoder means and including means for detecting the signals of the second encoded member relative to the first encoder member and having means for selective addition and subtraction of a unit reading from said second encoder means in accordance with opposite phase shift of said members from an in-phase position and offset of said coupling means and maintaining said output of said encoder means in response to said in-phase position to maintain the true reading of the movement of the first encoder means.

4,183,015

SIDE GUARD FOR BED INCLUDING MEANS FOR CONTROLLING REMOTE ELECTRICAL DEVICES

William D. Drew, Batesville; Leslie D. Foster, Brookville, both of Ind., and Dennis J. Gallant, Cincinnati, Ohio, assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Jun. 26, 1978, Ser. No. 919,327
Int. Cl.² H04Q *1/00*
U.S. Cl. 340—286 R **16 Claims**



1. In a guard structure for a bed of the type including a side guard for preventing accidental egress from the bed, means for mounting the side guard to the bed, and means for allowing the side guard to be moved fron an elevated to a lowered position to allow access to the bed, an improvement comprising:

control means mounted on the side guard in a position accessible and viewable by a person lying on the bed, said control means being connectable to at least one selectable remote electrical device remotely positioned away from the bed and said control means for permitting control of the operation of the remote electrical device from the bed.

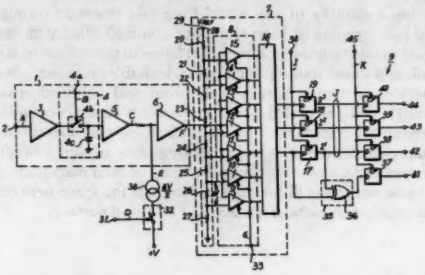
4,183,016

PARALLEL ANALOG-TO-DIGITAL CONVERTER WITH INCREASED RESOLUTION

Kiyoshi Sawagata, Yokohama, Japan, assignor to Sony Corp., Tokyo, Japan

Filed Sep. 8, 1978, Ser. No. 940,764
Claims priority, application Japan, Sep. 8, 1977, 52-107236
Int. Cl.² H03K *13/175*
U.S. Cl. 340—347 AD **9 Claims**

1. An analog-to-digital converter comprising sample-and-hold means for sampling an analog signal during predetermined sampling cycles to produce periodically sampled voltages; reference voltage supply means for supplying plural quantizing voltages having a quantizing voltage step ΔV; a plurality of voltage comparators for receiving each sampled voltage and said plural quantizing voltages to compare said sampled voltage to each of said quantizing voltages for determining the level of said sampled voltage relative to said quantizing voltages; encoding means responsive to said voltage comparators to produce a plural-bit code as a function of the determined sampled voltage level; offset voltage supply means operative to shift the sampled voltage level relative to said quantizing voltages during each sampling cycle; detecting



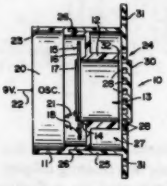
means coupled to receive the least significant bit in said plural-bit code produced by said encoding means for detecting whether said least significant bit changes in response to the operation of said offset voltage supply means; and output means for deriving an output digital signal formed of said plural-bit code produced by said encoding means and an additional bit derived from said detecting means.

4,183,017

ALARM BUZZER APPARATUS

Claude C. Sims, Orlando, Fla., assignor to Marine Resources, Inc., Fern Park, Fla.

Filed Jul. 13, 1978, Ser. No. 925,542
Int. Cl.² G10K *1/00*
U.S. Cl. 340—384 R **10 Claims**



1. An alarm buzzer consisting in combination:

a casing having a resonance cavity formed therein, said cavity having side walls and an open end;

a transducer mounted to said casing adjacent said resonant cavity;

an oscillator operatively coupled to said transducer for actuation thereof;

a grill attached to said casing and extending over said casing resonance cavity open end and being spaced from said side walls thereof; and

a reflector plate covering at least a portion of said grill extending over said resonance cavity, whereby an alarm buzzer is formed with a resonance cavity folded horn to increase the level of response therefrom.

4,183,018

MOTOR DRIVEN TYPE GONG STRIKING MECHANISM

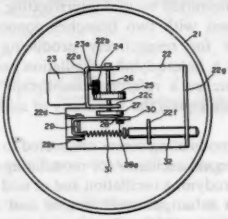
Mitsuo Sakaguchi, Tokyo, Japan, assignor to Kobishi Electric Co., Ltd., Japan

Filed Mar. 30, 1978, Ser. No. 891,601

Claims priority, application Japan, Dec. 6, 1977, 52-163630[U]; Dec. 6, 1977, 52-163631[U]

Int. Cl.[2] G10K *1/064*

U.S. Cl. 340—396 8 Claims



1. A motor driving type gong striking mechanism, which comprises:

a driving electric motor a driving electric motor mounted on a frame within a gong;

a piston plate supported on the frame and adapted to pivotally move back and forth in a substantially oscillatory motion from a first position to a second position and then back to the first postion in accordance with the rotation of the main shaft of said electric motor;

a pivotally movable transmission means for directly and continuously transmitting the rotation of the motor to said piston plate;

a hammer;

the gong spaced from the hammer and adapted to be struck by the hammer;

support means on the frame for supporting the hammer for oscillation;

spring means coupling the hammer to the piston plate for biasing and releasing such bias in response to oscillation of the piston plate to thereby cause oscillation of the hammer and cause the gong to be struck thereby.

4,183,019

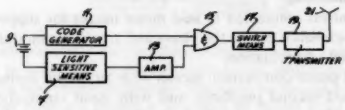
MONEY CLIP WITH LIGHT SENSITIVE DETECTOR

Gregory Lekhtman, Cote St. Luc, Canada, assignor to Barry Katsof, Quebec; Joel Matlin and Ronald Gordon, both of Dollard des Ormeaux, all of, Canada

Filed Aug. 23, 1978, Ser. No. 936,070

Int. Cl.[2] G08B *13/18*

U.S. Cl. 340—539 3 Claims



1. An electronic detection and transmission system, comprising:

a housing having a top surface;

an opening in said top surface;

light sensitive means disposed in said housing below said opening; and

a transmitter means disposed in said housing;

an amplifier;

said light sensitive means being connected to the input of said amplifier;

and a code generator connected in parallel with said light sensitive means;

said system further comprising an AND gate;

the output of said amplifier being connected to one input terminal of said AND gate;

the output of said code generator being connected to the other input terminal of said AND gate;

said transmitter means comprising an electronic ON/OFF switch;

the output of said AND gate being connected to the control terminal of said switch;

whereby, when said opening is uncovered and light is permitted to enter said opening and fall on said light sensitive means, said transmitter means will transmit a signal which corresponds with the code generated by said code generator.

4,183,020

AMPLIFIER WITH FIELD EFFECT AND BIPOLAR TRANSISTORS

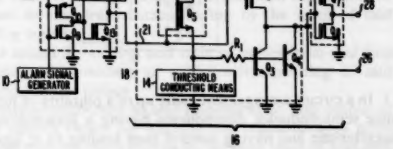
Otto H. Schade, Jr., N. Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 8, 1978, Ser. No. 940,573

Claims priority, application United Kingdom, Sep. 19, 1977, 38966/77

Int. Cl.[2] G08B *17/10, 21/00;* H03F *3/16*

U.S. Cl. 340—629 22 Claims



1. An amplifier comprising:

a reference potential terminal;

an operating potential terminal;

an input signal terminal;

an output signal terminal;

a first, enhancement-mode field effect transistor of a first conductivity type having a gate electrode to which said input signal potential terminal connects, having source and drain electrodes, and exhibiting a channel resistance between source and drain electrodes,

a second, bipolar transistor of said first conductivity type having an emitter electrode connected without substantial intervening impedance to said reference potential terminal, having a collector electrode connected to said output signal terminal, and having a base electrode;

threshold conducting means connected between the source electrode of said first transistor and said reference potential terminal, exhibiting a relatively high impedance when the potential between the source electrode of said first transistor and said reference potential terminal is less than a threshold value, which is not appreciably large compared to the gate-source forward-bias voltage of said first transistor but is somewhat larger than the emitter-to-base offset potential of said second transistor;

means for connecting said first field effect transistor in a switched current supply configuration, including a direct current conductive means connecting the drain electrode of said first field effect transistor to said operating potential terminal; and

first resistance means connected between the source electrode of said first transistor and the base electrode of said second transistor for limiting the current flowing between

the collector and emitter electrodes of said second transistor.

4,183,021

CIRCUIT ARRANGEMENT

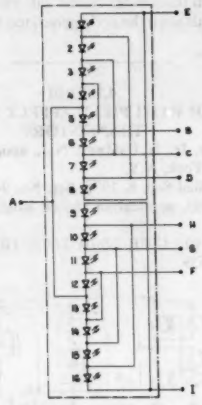
Dieter Gerstner, Heilbronn, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Mar. 29, 1977, Ser. No. 782,546

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613647

Int. Cl.[2] G01D 7/00

U.S. Cl. 340—753 **13 Claims**



1. In a circuit arrangement made up of a plurality of luminescence semiconductor components having a forward/reverse characteristic and having control lines leading to at least one part of the semiconductor components, the improvement comprising: a plurality of current branch pairs each including two current branches (S_1, S_2 or S_3, S_4) connected in parallel with each said current branch consisting of several said semiconductor components connected in series with the same polarity, and with the polarity of said components in one current branch being opposite to the polarity of said components in the parallel-connected current branch; a line (A) common to all current branches; each of said current branch pairs being connected between said line common to all current branches and a respective control line common to the current branch pair; and a respective additional control line connected to the connecting point between every two of said components in a current branch and to an associated connecting point between two of said components in the parallel-connected current branch, so that the number of control lines for a current branch pair corresponds at most to the number of said components in one current branch.

4,183,022

TRANSPONDER FOR RADIOCOMMUNICATION SYSTEM, PARTICULARLY FOR MEASURING THE DISTANCE BETWEEN TWO STATIONS

Thierry Baudard, Paris; Max Schumperli, Bailey, and Alain Pouzet, Castanet, all of France, assignors to Electronique Marcel Dassault, Paris, France

Filed Jun. 2, 1977, Ser. No. 803,115

Claims priority, application France, Jun. 3, 1976, 76 16808

Int. Cl.[2] G01S 9/56

U.S. Cl. 343—6.8 R **5 Claims**

1. In a radiocommunication system including an interrogating station transmitting a phase-modulated UHF carrier wave and a transponder station responsive to said carrier wave for sending back a main UHF carrier phase-modulated by a locally generated subcarrier,

the improvement wherein said transponder station comprises:

oscillation-generating means including a first voltage-controlled oscillator for producing said main UHF carrier;

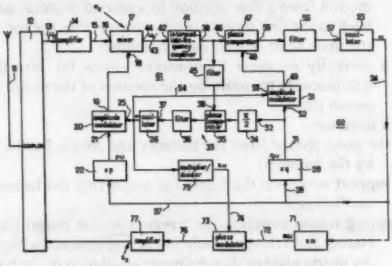
a subcarrier source including a second voltage-controlled oscillator;

receiving means for intercepting an incoming UHF carrier wave transmitted by said interrogating station;

circuit means with two branches connected to said first oscillator for respectively producing in one of said branches a heterodyning oscillation and in the other of said branches a reference oscillation with frequencies whose sum equals the frequency of said incoming carrier wave;

amplitude-modulating means connected to said branches and to said second oscillator for modulating the amplitudes of said heterodyning oscillation and of said reference oscillation with an output oscillation of said second oscillator, said output oscillation having a frequency equaling the phase-modulation frequency of said incoming carrier wave;

mixer means with inputs connected to said one of said branches and to said receiving means for deriving from said incoming carrier wave and from the amplitude-



modulated heterodyning oscillation a phase-modulated and amplitude-modulated i-f oscillation having the same frequency as said reference oscillation;

first phase-comparison means with input connections to said mixer means and to said other of said branches for detecting phase difference between said i-f oscillation and said reference oscillation and for deriving therefrom an error signal fed to said first oscillator for introducing compensatory phase changes in said heterodyning and reference oscillations;

filter means connected to said mixer means for suppressing the sidebands due to the phase and amplitude modulations of said i-f oscillation;

second phase-comparison means with an output connection to said second oscillator and with input connections to said filter means and to said other of said branches for receiving therefrom said i-f oscillation and said reference oscillation in substantially unmodulated form and for deriving from their phase difference a corrective signal controlling the phase of said output oscillation;

phase-modulating means connected to said oscillation-generating means and to said subcarrier source for producing a phase-modulated outgoing UHF carrier stabilized to frequency and phase by said incoming carrier wave; and

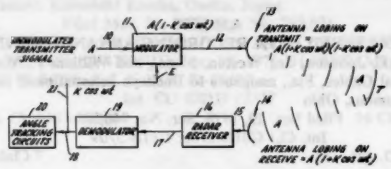
transmitting means connected to said phase-modulating means for emitting said outgoing carrier.

4,183,023

ANTI-JAM DEVICE FOR A CONICAL SCAN TRACKING RADAR

James G. Holman, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 20, 1962, Ser. No. 189,214
Int. Cl.[2] G01S 7/36
U.S. Cl. 343—18 E 5 Claims



1. An anti-jam device for conical scan tracking radar comprising:

an input circuit to a conical scanning radar antenna for transmitting signals into the atmosphere, said signals appearing effectively unmodulated when viewed from a target;

a radar receiver for receiving echo signals from said target;

a modulator circuit coupled to said input circuit; and

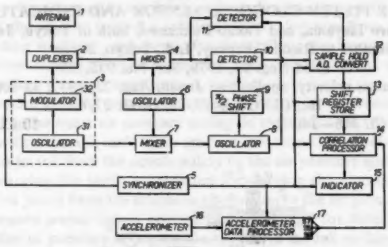
means coupling said receiver to said modulator circuit to apply said received echo signals to said modulator circuit as a divider of radio frequency energy whereby the amplitude modulation produced by the conical scanning radar antenna on the transmitted signals appears effectively eliminated when said signals are viewed from said target.

4,183,024

SIDE-LOOKING RADAR SYSTEMS

Seville R. Brooks, Ongar, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Dec. 19, 1977, Ser. No. 862,096
Claims priority, application United Kingdom, Feb. 16, 1977, 6555/77
Int. Cl.[2] G01S 9/02
U.S. Cl. 343—5 ST 13 Claims



1. A side-looking coherent pulse radar for use on a platform adapted to move in a preferred manner but subject to deviations from said preferred manner, the radar including a receiving means having a detector arranged to detect echo pulses having a Doppler frequency component and to apply output signals to a correlation processor means, said correlation processor means including means for sampling the detector output signals, means for producing a reference correlation signal which characterizes an output from the receiver which would be expected from a target when the platform is moving in the said preferred manner, and means for performing a correlation process on said output signals of the detector with said reference correlation signal to provide information concerning the positions of objects, the radar also including means for deriving signals representing said deviations and means for utilizing the signals to effect an adjustment such that the output of the processor means is compensated for the said deviations.

4,183,025

LEVEL INDICATING SYSTEM

Ken Kutaragi, Kawasaki, and Masayoshi Nakamura, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 10, 1978, Ser. No. 885,262
Claims priority, application Japan, Mar. 18, 1977, 52/30012
Int. Cl.[2] G01R 19/16; G08B 5/36
U.S. Cl. 324—103 P 9 Claims

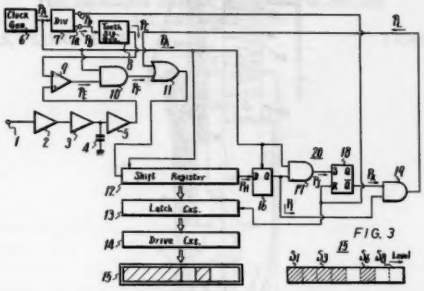


FIG. 3

1. Apparatus for indicating the level of an analog signal which is subject to variations in its amplitude comprising:

first means for providing a train of pulses during a recurring time interval of predetermined period, with the number of pulses in said train corresponding to the level of said analog signal;

second means for storing said train of pulses from said first means and providing an output corresponding to said stored train of pulses;

third means connected to and responsive to said output of said second means for forming and regenerating a pulse whose position corresponds to the peak level of said analog signal during any preceding time interval;

fourth means for feeding said pulse formed in said third means back to said second means and for combining said pulse with said train of pulses provided by said first means; and

display means for displaying at least said peak level of said analog signal in response to said output from said second means.

4,183,026

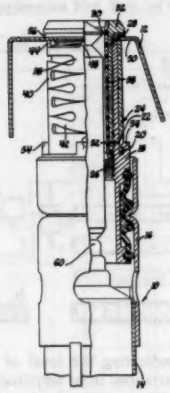
ANTENNA MOUNT FOR A VEHICLE RADIO ANTENNA

Harry C. Buchanan, Jr., Springvalley, Ohio, and James L. Hussey, Centerville, Ohio, assignors to General Motors Corporation

Filed Jul. 10, 1978, Ser. No. 923,395
Int. Cl.[2] H01Q 1/32, 9/30; H01B 17/26
U.S. Cl. 343—715 2 Claims

1. An antenna mount for a vehicle radio antenna having a mast slidably disposed in a mast jacket and being extensible and retractable through an opening in the vehicle body, said antenna mount comprising; a housing connected to said mast jacket and having a cylindrical body portion with an internally threaded surface, an annular support surface extending radially outward from said cylindrical body portion and a plurality of retaining members extending axially from said annular support surface and being spaced radially from said cylindrical body portion; a collapsible spacer having a generally cylindrical shape and having formed thereon a support portion, a plurality of serially arranged pairs of cantilever springs with each spring having a free end and a base end, a first pair of said springs having surface engaging means for engaging the inner surface

of said vehicle body adjacent the opening therein and the base ends integral with the free ends of a second pair of said springs in the series, each of the pairs of springs intermediate the first and last pairs of springs having the free ends thereof integral with the base ends of the prior pair of springs and the base ends thereof integral with the free ends of the next following pair of springs, and said last pair of springs having the base ends thereof integral with said support portion of said collapsible spacer and a plurality of retaining means formed on said support portion for cooperating with said retaining members on



said housing to prevent relative movement between said housing and said support portion of said collapsible spacer; and fastening means having an externally threaded portion engaged in the internally threaded surface and a head portion abutting the outer surface of said vehicle body circumjacent the opening therein, said fastening means being rotatable to cause said housing and said collapsible spacer to move longitudinally toward said vehicle body and said collapsible spacer being deformed at said cantilever springs to conform to the inner surface of said vehicle body and to maintain a retaining force against said vehicle body.

4,183,027

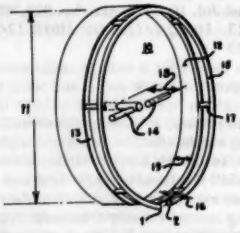
DUAL FREQUENCY BAND DIRECTIONAL ANTENNA SYSTEM

Hermann W. Ehrenspeck, 94 Farnham St., Belmont, Mass. 02178

Continuation of Ser. No. 840,469, Oct. 7, 1977, abandoned. This application Aug. 18, 1978, Ser. No. 935,048

Int. Cl.[2] H01Q *3/00*

U.S. Cl. 343—726 **17 Claims**



1. A dual frequency band directional antenna system comprising a cavity reflector antenna having a cavity, said cavity reflector antenna having predetermined outer dimensions. first feed means for said cavity reflector antenna, a loop forming an antenna having approximately the same outer dimensions as the cavity reflector antenna and being arranged outside and in front of said cavity reflector antenna at a predetermined distance therefrom, said cavity acting simultaneously as a reflector for said cavity reflector antenna and said loop, and second feed means for said loop such that said dual frequency antenna system is capable of receiving and transmitting two distinct frequency ranges.

4,183,028

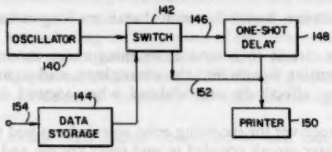
HIGH SPEED DATA RECORDING ARRANGEMENT

Clark E. Johnson, Jr., Weston, Mass., and William F. Main, Coral Gables, Fla., assignors to Buckeye International, Inc., Columbus, Ohio

Filed Sep. 29, 1978, Ser. No. 946,849

Int. Cl.[2] G01D *9/00*; G11B *5/09*

U.S. Cl. 346—35 **7 Claims**



1. An arrangement for high speed recording to reduce the time for recording information, comprising data storage means for storing elements of information to be recorded, recording means for recording information on a recording medium, means for transmitting said elements to said recording means, said recording means being operable to record within a predetermined time duration said elements of information transmitted from said data storage means, and means for reducing the recording time operatively associated with said data transmission means and comprising means for detecting the value of an element of information transmitted from said data storage means and means for skipping said recording step when said information has a predetermined value.

4,183,029

INK FILTER CLOGGING SENSOR AND INDICATOR

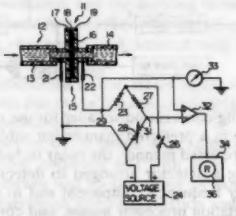
Takuro Isayama, and Takao Fukazawa, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 21, 1978, Ser. No. 935,129

Claims priority, application Japan, Aug. 23, 1977, 52-100978

Int. Cl.[2] G01D *15/18*; G01R *27/02*

U.S. Cl. 346—140 R **10 Claims**



1. In an ink jet printing apparatus having an ink supply conduit and an ink filter provided in the conduit, the combination characterized by comprising:

a first electrode provided in the conduit upstream of the filter;

a second electrode provided in the conduit downstream of the filter; and

sensor means connected to the first and second electrodes for sensing an electrical parameter therebetween.

4,183,030

INK JET RECORDING APPARATUS

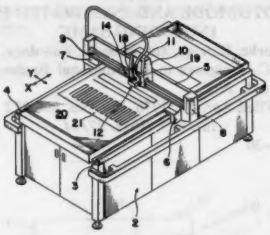
Shozo Kaieda, Yokohama; Masayuki Mutoh, Kawasaki, and Kuniaki Kamimura, Atsugi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 30, 1977, Ser. No. 783,031

Claims priority, application Japan, Apr. 1, 1976, 51-36753; Apr. 15, 1976, 51-47801[U]; Apr. 23, 1976, 51-48207; May 12, 1976, 51-54758; Jun. 1, 1976, 51-64403

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—140 R **14 Claims**



1. An ink jet recording apparatus having at least one ink tank for containing therein a sustantial amount of ink, a nozzle connected to said ink tank for discharging the ink within the ink tank to the outside of said ink tank, an electrode supported in position in spaced relation to said nozzle, means connected to said nozzle and said electrode for applying a voltage between said nozzle and said electrode for establishing an electric field between said nozzle and said electrode, said nozzle and voltage applying means having a shape and applying a sufficient voltage for producing an electric field having an intensity which is symmetrical with respect to the center of the nozzle for causing the ink droplets to travel straight from the nozzle and having a strength for causing the ink to be drawn out of the nozzle due to the field alone, means connected to said nozzle for moving the nozzle relative to a recording medium with the tip of the nozzle spaced a predetermined distance from the recording medium, and means for controlling the amount of ink jetted from the nozzle towards the recording medium, said controlling means comprising;

pressure control means connected to said tank for controlling the static air pressure acting on the surface of the ink within the ink tank to an amount less than that necessary to jet ink from the nozzle solely by the air pressure and for varying the static air pressure for varying the amount of ink jetted from the nozzle in proportion to the air pressure;

pressure sensor means connected to said tank for detecting the air pressure acting on the surface of the ink within the ink tank and for generating an output signal indicative of the value of the pressure thus detected;

signal generating means for generating a signal corresponding to the value of an air pressure equivalent to an amount of the ink which is desired to be jetted from the nozzle in relation to the operation of the ink jet recording apparatus in order to draw a line of a predetermined width;

comparison means connected to said signal generating means and said pressure sensor means for comparing the output signal from said pressure sensor means with the signal from said signal generating means for generating an output signal indicative of any difference therebetween; and

operating means connected between said comparison means and said pressure control means for operating the pressure control means in response to the output signal from said comparison means, whereby the ink jetted from the nozzle is controlled to draw a line of predetermined width.

4,183,031

INK SUPPLY SYSTEM

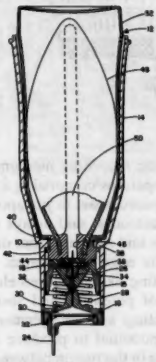
Edmond L. Kyser, Portola Valley; Charles S. Mitchell, Palo Alto, and Stephan B. Sears, Portola Valley, all of Calif., assignors to Silonics, Inc., Sunnyvale, Calif.

Division of Ser. No. 694,064, Jun. 7, 1976, Pat. No. 4,074,284.

This application Jun. 16, 1977, Ser. No. 807,219

Int. Cl.[2] G01D *15/16*

U.S. Cl. 346—140 R **1 Claim**



1. In an ink jet printer having a head with means for ejecting ink droplets therefrom, an ink supply cartridge, a receptacle for receiving said cartridge and means for supplying ink from said receptacle to said head, a mechanism for removably holding said cartridge on said receptacle in a manner to minimize any amount of air introduced into the ink supply system and print head upon removing and inserting the cartridge without the use of an air trap in the ink supply system, said mechanism comprising:

a septum covering an ink supply opening of said cartridge,

a hollow needle extending from said receptacle with a free end capable of extending through said septum and having an opening adjacent said free end,

means for removably latching said cartridge onto said receptacle in a position that said needle extends through said septum, thereby to establish ink communication from the interior of said cartridge through said supplying means to said ink ejecting head,

said cartridge including means for applying a compressive force to its ink supply, thereby to force ink into said supplying means under pressure when the cartridge is latched onto said receptacle,

a solid block of sealing material slidable along the length of the needle between one extreme position over said needle opening and another extreme position along the needle away from said opening,

resilient means carried by said receptacle for normally urging said seal to its said one extreme position when the container is removed, and

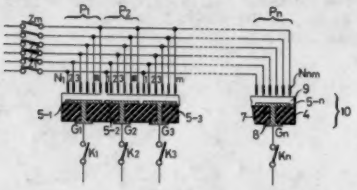
means for urging said seal to its said another extreme position in response to the container being latched onto said receptacle,

whereby said ink supply system is closed off to both liquid and gas when said ink cartridge is removed in order to minimize any amount of air introduced into said ink supply system.

4,183,032
ELECTROSTATIC RECORDING MEDIUM WITH ELONGATED CONDUCTIVE SEGMENTS

Tamio Ohbori, Yokohama; Fuyuhiko Matsumoto, and Satoru Tomita, both of Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Jan. 12, 1978, Ser. No. 868,741
Claims priority, application Japan, Jan. 12, 1977, 52-1425; May 11, 1977, 52-53233
Int. Cl.[2] G01D *15/06*; G03G *15/044*
U.S. Cl. 346—155 **12 Claims**



1. An electrostatic recording medium for use with electrostatic recording apparatus comprising a plurality of recording electrode arrays spaced apart in juxtaposition to a plurality of complementary electrodes, said arrays comprising electrodes spaced apart across said medium from one edge of a recording area to the opposite edge of said area, first switching means selectively connecting like-numbered electrodes of said arrays to a first source of potential, and second switching means selectively connecting said complementary electrodes to a second source of potential to produce a limited electrostatic field in said medium in the region between the selected complementary electrode and the selected one of said like-numbered electrode juxtaposed with respect to said selected complementary electrode, said electrostatic recording medium comprising:

an insulating resin base;

a conductive layer on said insulating base, said conductive layer being divided into a plurality of elongated segments arranged side-by-side from said one edge to said opposite edge, each of said conductive layer segments being electrically separated from adjacent said segments;

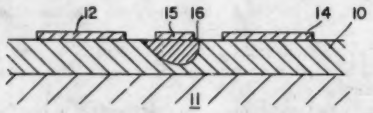
a plurality of conductive portions extending through said base and exposed at the underside thereof to be brought into contact, selectively, with a respective one of the complementary electrodes, each of said conductive portions being electrically connected on the other side of said base with a respective one of said segments, whereby said conductive portions selectively connect said complementary electrodes to said elongated segments; and

a dielectric layer on said conductive layer.

4,183,033
FIELD EFFECT TRANSISTORS

Huw D. Rees, Malvern, England, assignor to National Research Development Corporation, London, England

Filed Mar. 13, 1978, Ser. No. 886,199
Int. Cl.[2] H01L *29/80*
U.S. Cl. 357—22 **7 Claims**



1. A field effect transistor maintained at an operating temperature below 150° K. comprising:

a substrate of resistivity greater than 10^4 ohm-cm at the operating temperature;

a layer of semiconductor formed thereon;

metal source, drain and gate electrodes in contact with said substrate;

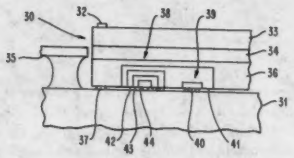
said source and said drain electrodes being arranged with respect to said gate electrode to provide a controllable channel in said layer for charge carrier flow therebetween;

said layer having a concentration of free carriers less than 10^{16} cm^{-3} such that, at the operating temperature, carrier velocity saturation in said layer is achieved at an applied electric field intensity of less than 1 $KVcm^{-1}$.

4,183,034
PIN PHOTODIODE AND INTEGRATED CIRCUIT INCLUDING SAME

Richard G. Burke, Raleigh, and James S. Kolodzey, Chapel Hill, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,872
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 **10 Claims**



1. A PIN photodiode comprising: a semiconductor chip having at least two surfaces and edge surfaces extending therebetween, said chip having a P region extending from one surface inwardly, an N region extending from said other surface inwardly and a substantially uniform thin I region, having a substantial extent in at least one direction so as to provide increased responsivity to a broad range of wave lengths of photo energy, separating said P and N regions and extending to at least one of said edge surfaces whereby photoenergy may enter the I region along said at least one direction directly without passing through the other regions, an anode electrode in contact with said P region surface, and a cathode electrode in contact with said N region surface said P and N regions in a direction normal to said at least two surfaces are substantial in extent and greater than the I region.

4,183,035
INVERTED HETEROJUNCTION PHOTODIODE

Cheng-Chi Wang; John G. Pasko; Joseph T. Longo, all of Thousand Oaks, and John E. Clarke, Newbury Park, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 26, 1978, Ser. No. 919,022
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 **5 Claims**

1. A semiconducting device comprising:

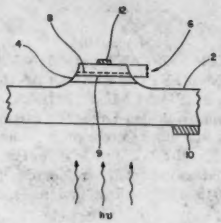
a substrate comprising a PbTe crystal of n-type conductivity;

an epitaxial buffer layer of $Pb_{(1-x)}X_xTe$ of n-type conductivity on said substrate, wherein X is a Group VI element selected from the group consisting of S and Se and wherein x is a value greater than 0 but less than 0.1;

an epitaxial active layer of $Pb_{(1-y)}Sn_yTe$ on said buffer layer, wherein y is a value greater than 0 but less than 0.3, said active layer forming a heterojunction between said active layer and said buffer layer;

a p-n junction located outside said buffer layer in either said

active layer or in said heterojunction, the n side of said p-n junction being adjacent said buffer layer; and



electrical contact means coupled to said substrate and to said active layer.

4,183,036

SCHOTTKY-TRANSISTOR-LOGIC

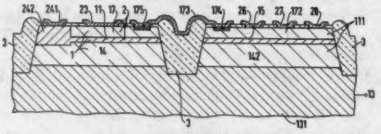
Rüdiger Müller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 20, 1977, Ser. No. 798,798

Claims priority, application Fed. Rep. of Germany, May 31, 1976, 2624339; May 31, 1976, 2624409

Int. Cl.[2] H01L *27/04;* **H03K** *19/08*

U.S. Cl. 357—44 **3 Claims**



1. Schottky-transistor-logic comprising a highly doped semiconductor substrate of one conductivity type, an epitaxial layer of said one conductivity type on said substrate, a buried layer of the other conductivity type in said epitaxial layer spaced below the outer surface of said epitaxial layer in a plane substantially parallel to said outer surface, an insulating wall extending through said epitaxial layer and into said substrate thereby dividing said epitaxial layer into two zones, a collector and an emitter being provided in one of said zones by portions of said epitaxial layer above and below said buried layer, and a base being provided by said buried layer between said collector and said emitter, a Schottky-transistor being provided in said one zone by a Schottky electrode on the surface of said epitaxial layer, a portion of said epitaxial layer and a portion of said buried layer therebetween, a plurality of additional Schottky electrodes on the surface of said other zone of said epitaxial layer, said plurality of additional Schottky electrodes possessing a lower Schottky-barrier than the output Schottky electrode of said output transistor, and an external contact connecting the two portions of said epitaxial layer lying above said buried layer.

4,183,037

SEMICONDUCTOR DEVICE

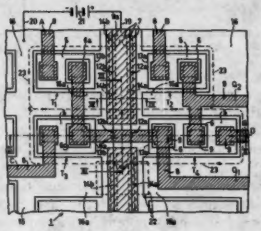
Claude J. P. F. Le Can, Nijmegen; Cornelis M. Hart, and Hendricus E. J. Wulms, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 2, 1977, Ser. No. 847,723

Claims priority, application Netherlands, Jan. 17, 1977, 7700420

Int. Cl.[2] H01L *27/04*

U.S. Cl. 357—44 **9 Claims**



1. A semiconductor device having a semiconductor body comprising:

a surface-adjoining region of the first conductivity type;

a current conductor of which at least a part comprises a surface-adjoining strip-shaped semiconductor zone of the second conductivity type;

at least one surface-adjoining further zone of the second conductivity type on at least one side of the strip-shaped semiconductor zone, which is separated from the strip-shaped semiconductor zone by a part of the region of the first conductivity type and which forms part of a semiconductor element;

said strip-shaped semiconductor zone, in as far as it forms part of the said part of the current conductor, is covered substantially throughout its surface by a metal and is contacted with said metal layer at least at the ends of the said part of the current conductor, in order to reduce the voltage drop across the said part of the current conductor as much as possible;

such that at least one conductor track crosses the said part of the current conductor and the said metal layer is interrupted at the area of the crossing, the resulting parts of the metal layer contacting the strip-shaped semiconductor zone at least at their ends, wherein said current conductor further comprises:

an uninterrupted layer of a refractory conductive material which entirely covers the region of the first conductivity type between the strip-shaped zone and the further zone of the second conductivity type and is separated therefrom by an electrically insulating layer;

the edges of said layer of refractory conductive material in projection coinciding substantially with at least one edge of said strip-shaped semiconductor zone and with the oppositely located edge of the further semiconductor zone; and

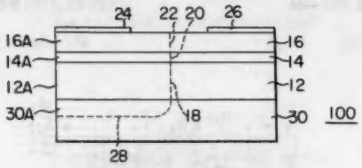
said layer of the refractory conductive material, at the area of the crossing, being conductively connected to the metal layer and being separated from the crossing conductor track by an insulating layer.

4,183,038

SEMICONDUCTOR LASER DEVICE

Hirofumi Namizaki; Wataru Susaki, both of Amagasaki, and Hirofumi Kan, Moris, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1978, Ser. No. 892,407
Int. Cl.[2] H01L *33/00*
U.S. Cl. 357—17 **10 Claims**



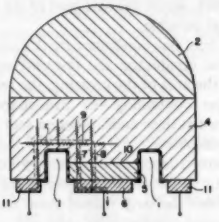
1. A semiconductor laser device comprising an electrically semi-insulating semiconductor substrate, a first semiconductor layer of a first type conductivity formed on said semiconductor substrate, a second semiconductor layer of the first type conductivity formed on said first semiconductor layer and narrower in forbidden band-width than said first semiconductor layer, a third semiconductor of the first type conductivity formed on said second semiconductor layer and broader in forbidden band-width than said second semiconductor layer, a fourth semiconductor portion of a second type conductivity continuously formed in predetermined regions of said first, second and third semiconductor layers and extending into said semiconductor substrate, said fourth semiconductor portion forming pn junctions with said first, second and third semiconductor layers, the pn junction in said second semiconductor layer serving as a light emitting region, a first electrode disposed in ohmic contact with a semiconductor region having said first type conductivity and a second electrode disposed in ohmic contact with a semiconductor region having said second type conductivity.

4,183,039

LIGHT EMITTING SEMICONDUCTOR DEVICE

Masaaki Aoki, Kokubunji; Yuichi Ono, Tokyo; Makoto Morioka, Tokyo; Kazuhiro Ito, Tokyo; Mitshiuro Mori, Kokubunji, and Kazuhiro Kurata, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 6, 1978, Ser. No. 913,055
Claims priority, application Japan, Jun. 10, 1977, 52-67895
Int. Cl.[2] H01L *33/00*
U.S. Cl. 357—17 **11 Claims**



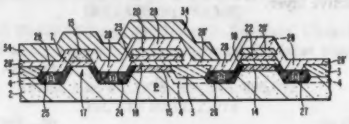
1. A light emitting semiconductor device comprising a p-n junction which is made up of semiconductor layers of first and second conductivity types, a low-resistance semiconductor layer which adjoins the first conductivity type semiconductor layer and which contains large quantities of impurity of said first conductivity type therein, a semiconductor layer for giving out light which adjoins said low-resistance semiconductor layer and which has said first conductivity type, and a ditch which is provided from a surface of said second conductivity type semiconductor layer in a manner to surround said p-n junction, a distance between a bottom of said ditch and said low-resistance semiconductor layer being at most $\frac{1}{2}$ of a width of said ditch.

4,183,040

MOS RAM WITH IMPLANT FORMING PERIPHERAL DEPLETION MOSFET CHANNELS AND CAPACITOR BOTTOM ELECTRODES

Vincent L. Rideout, Mohegan Lake, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 702,247, Jul. 2, 1976, Pat. No. 4,085,498, which is a continuation-in-part of Ser. No. 656,756, Feb. 9, 1976, Pat. No. 4,075,045. This application Jan. 31, 1978, Ser. No. 874,006
Int. Cl.[2] H01L *27/04, 29/78, 29/94*
U.S. Cl. 357—41 **7 Claims**



1. A random access memory integrated circuit comprising an array of dynamic one-device memory cells wherein each cell contains an enhancement-mode FET switch and a charge storage capacitor; and circuits peripheral to the array containing both enhancement-mode FETs and depletion-mode FETs; said integrated circuit comprising:

(A) a semiconductive substrate of a first conductive type containing active impurities of a first conductive type;

(B) doped polycrystalline silicon FET enhancement-mode gate electrodes delineated from a first layer of polycrystalline silicon;

(C) doped polycrystalline silicon electrodes delineated from a second layer of polycrystalline silicon deposited subsequent to said first layer of polycrystalline silicon, wherein the electrodes delineated from said second layer which are located in the array provide the upper electrodes of the charge storage capacitors, and wherein the electrodes delineated from said second layer which are located in circuits peripheral to the array provide the FET depletion-mode gate electrodes;

(D) low concentration doping of a second and opposite conductive type beneath the electrodes delineated from said second layer, wherein the doping which is in the array provides the lower electrodes of the charge storage capacitors, and wherein the doping which is in the circuits peripheral to the array provides the depletion-mode channel regions;

(E) high concentration doping of a second and opposite conductive type wherein the high concentration doping which is in the array provides the doped bit line and the electrical connection between the FET switches and the lower electrodes of the charge storage capacitors; and wherein the high concentration doping which is in the circuits peripheral to the array provides the source and drain regions for both the enhancement-mode FETs and depletion-mode FETs located in the circuits peripheral to the array;

(F) a high-electrical conductivity metallic-type interconnection pattern wherein the metallic-type pattern which is in the array provides the word lines to the memory cells, and the metallic-type pattern in the circuits peripheral to the array serves as an interconnection line pattern;

(G) self-registering electrical connection between high-electrical conductivity type interconnection pattern and said polycrystalline silicon enhancement-mode gate electrodes whereby said enhancement-mode gate electrodes have

their top surfaces free from oxide and their sides having oxide insulation thereon;

(H) wherein said low concentration doping is several orders of magnitude lower than said high concentration doping;

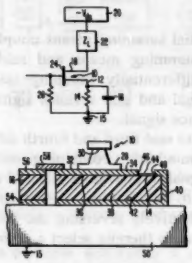
(I) oxide isolation regions above or recessed into the substrate providing insulating field oxide regions separating memory cells and enhancement-mode and depletion-mode FETs from other memory cells and FETs on the same semiconductive substrate; and

(J) insulators separating enhancement-mode FET gates, and depletion-mode FET gates from the substrate, and separating the upper and lower electrodes of the charge storage capacitors from each other.

4,183,041
SELF BIASING OF A FIELD EFFECT TRANSISTOR MOUNTED IN A FLIP-CHIP CARRIER

Jitendra Goel, Kendall Park, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,069
Int. Cl.² H01L *29/80, 27/02, 23/02*
U.S. Cl. 357—81 **3 Claims**



1. A circuit that includes a field effect transistor having pluralities of unit gates, unit drains and unit sources disposed upon a substrate, said unit sources being plated with an electrically conductive material to form posts on said unit sources with distal surfaces having a displacement from said substrate greater than the displacement of the distal surfaces of said unit gates and said unit drains from said substrate, said distal ends of said posts being in contact with the top surface of a flip-chip carrier, the improvement comprising:

a block of an electrically insulating material having a thermal resistance that approximates the thermal resistance of brass;

a metal plate having first and second surfaces in contact with one surface of said block and the bottom surface of said carrier, respectively, whereby said plate is between said block and said carrier;

a metal sheet formed for contact with said one surface of said block and a surface of said block opposed therefrom, said sheet extending over said one surface of said block sufficiently only to provide a gap for a discontinuity in the electrical conduction path through said metal sheet and said metal plates;

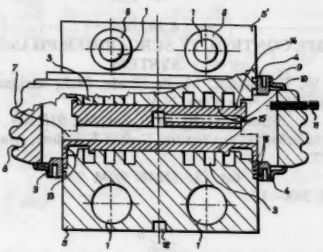
a block of brass having one surface in thermal and electrical contact with said opposed surface of said metal sheet, said block serving as the ground plane of said circuit; and

a film resistor disposed upon said block between said gap and on the surface of said insulating block, said resistor connecting said metal plate and said metal sheet to provide thereby an electrical resistance between said unit sources for self-biasing said transistor whereby said unit sources are thermally coupled by the low thermal resistance path formed by said metal plate, said metal sheet and said insulating and brass blocks.

4,183,042
POWER SEMICONDUCTOR DEVICE

Petr Novak, No. 1565 Hvezdova, Praha 4; Jaroslav Pellant, No. 4 Legerova, Praha 2; Jaroslav Zuna, No. 10 Kmochova, Praha 5; Jindrich Kratina, No. 604 Klanovicka, Praha 9; Pavel Reichel, No. 14 Lopatecka, Praha 4, and Pavel Kafunek, No. 19 Sarajevska, Prague 2, all of Czechoslovakia

Filed Feb. 10, 1978, Ser. No. 876,835
Claims priority, application Czechoslovakia, Feb. 18, 1977, 1088-77
Int. Cl.² H01L *25/04*
U.S. Cl. 357—82 **8 Claims**



1. A power semiconductor device comprising:

a semiconductor junction section;

two first electrode parts having their inner sides attached to opposite sides of the semiconductor junction section;

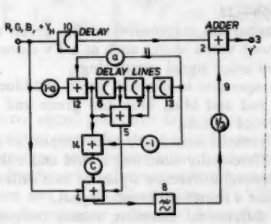
two second electrode parts attached to the outer sides of the respective first electrode part and each second electrode part defining a system of hollow spaces therein, said system of hollow spaces of the second parts have first passages disposed in a first plane and second passages disposed in a second plane, said first and second planes being parallel to said semiconductor junction section and are provided with an inlet and outlet port, at least one third passage connecting said first and second passages; and

an insulating collar mechanically connecting the two electrode parts to each other.

4,183,043
TRILINEAR SEQUENTIAL TRANSMISSION SYSTEM FOR A COLOR TELEVISION SIGNAL, PARTICULARLY FOR A RECORDING

Gerald Dickopp, Hanover; Gerhard Mahler, Rodenberg-Algesdorf, and Werner Scholz, Gehrden, all of Fed. Rep. of Germany, assignors to TED Bildplatten Aktiengesellschaft, Switzerland

Filed Mar. 23, 1977, Ser. No. 780,414
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1976, 2612619
Int. Cl.² H04N *9/42*
U.S. Cl. 358—11 **15 Claims**



1. In a three-line sequential transmission system for a color

television signal, particularly for recording, where the sequential signal is transformed again, during reproduction with a series-connection of line delay lines, into three simultaneous color signals, and a luminance signal is obtained by composing the signals from several successive lines, the improvement comprising means deriving a luminance signal, composed from signals from several successive lines, with an amplitude ratio between said signals, to increase the picture sharpness in the vertical direction, such that the amount of the luminance transmission function of the entire system, including recording and reproduction, at the frequencies $(n+\frac{1}{2})f_H$ is substantially equal to those at the frequencies $n \cdot f_H$ where $n=0, 1, 2 \ldots$ and f_H is the line frequency.

4,183,044

REMOTE CONTROL TV SUBCARRIER PHASE SHIFTER SYSTEM

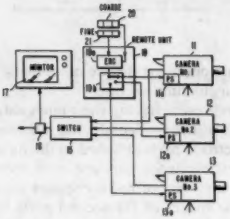
David W. Breithaupt, Maple Shade, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 30, 1978, Ser. No. 910,888

Claims priority, application United Kingdom, May 30, 1977, 22807/77

Int. Cl.² H04N 9/04, 9/44

U.S. Cl. 358—17 **11 Claims**



1. A system for remotely controlling the color subcarrier signal phase in a television camera including a source of color subcarrier signals, comprising:

encoder means remotely located from said camera and having manual phase select means for providing binary digital code signals representing a selected phase shift of the color subcarrier in the camera,

said camera including a digital phase shifter coupled to said source for selectively changing the subcarrier phase, and

means for coupling said binary digital code signals from said remote means to said digital phase shifter in said camera for providing remote adjustment of the subcarrier phase.

4,183,045

CHROMA KEYING SELECTOR SYSTEM

Donald C. Herrmann, Hartsville, Pa., and Lucas J. Bazin, Vincentown, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1978, Ser. No. 938,244

Int. Cl.² H04N 5/22

U.S. Cl. 358—22 **8 Claims**

1. An apparatus responsive to red, green and blue video signals from a video source such as a TV camera for selecting any desired color signal comprising:

means responsive to said red, green and blue signals to produce red and blue, blue and green and green and red difference signals,

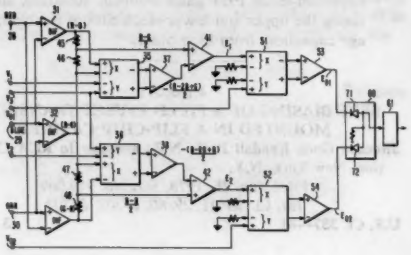
first differential summing means coupled to said first means for differentially summing a first and either said first or said second difference signal of said difference signals to produce a fourth difference signal,

second differential summing means coupled to said first means for differentially summing a second and a third of said difference signals to produce a fifth difference signal,

first additive means coupled to said first means for additively summing said first and second difference signals to provide a sixth signal,

second additive means coupled to said first means for additively summing said second and third difference signals to provide a seventh signal,

third differential summing means coupled to said first differential summing means and said first additive means for differentially summing said fourth difference signal and said sixth signal to provide an eighth difference signal and,



fourth differential summing means coupled to said second differential summing means and said second additive means for differentially summing said fifth difference summing signal and said seventh signal for providing a ninth difference signal,

means coupled to said third and fourth differential summing means for non-additive combining said eighth and ninth difference signal to provide a selected color signal and,

means coupled to said first and second differential summing means for selectively reversing the phase of said fourth and fifth signal to thereby select a desired color signal.

4,183,046

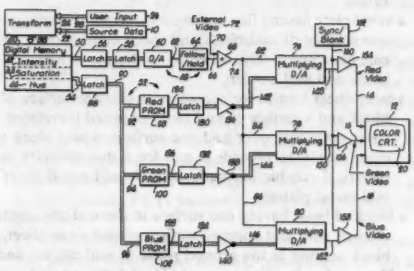
ELECTRONIC APPARATUS FOR CONVERTING DIGITAL IMAGE OR GRAPHICS DATA TO COLOR VIDEO DISPLAY FORMATS AND METHOD THEREFOR

George W. Dalke, Lawrence, and Michael D. Buchanan, Overland Park, both of Kans., assignors to Interpretation Systems Incorporated, Lawrence, Kans.

Filed Aug. 17, 1978, Ser. No. 934,630

Int. Cl.² H04N 9/12

U.S. Cl. 358—22 **16 Claims**



1. A method of converting image data to a color video display format, including the steps of:

(A) transforming said image data into a data word having first, second, and third groups of information characters respectively associated with the intensity, hue and saturation characteristics of said format;

(B) generating a set of color data in accordance with the

information represented by said second and third groups of information characters in said word;

(C) altering said set of color data in accordance with the information represented by said first group of information characters in said word;

(D) producing said format using said altered set of color data.

4,183,047

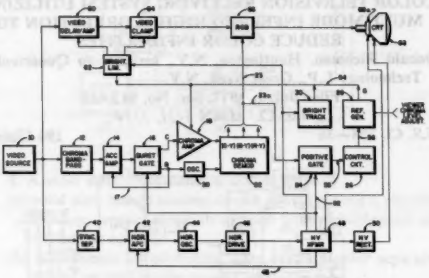
CHROMA LEVEL STABILIZER

Seung K. Kim, and John F. Shouse, Jr., both of Portsmouth, Va., assignors to General Electric Company, Portsmouth, Va.

Filed Dec. 8, 1977, Ser. No. 858,602

Int. Cl.[2] H04N 9/535

U.S. Cl. 358—27 **18 Claims**



1. In a color television receiver having chrominance processing circuits including a variable gain chroma amplifier for controlling the amplitude of demodulated R-Y, B-Y and G-Y color difference signals, a chroma level control circuit comprising:

chroma reference means generating a chroma reference signal in accordance with a desired chroma level for the televised scene,

gating means coupled to receive at least a selected one of said color difference signals and providing a signal output representing a preferred portion thereof, and

control means coupled to said gating means and responsive to said signal output to develop a chroma level stabilizing signal, said control means including means to average said signal output such that the amplitude of said chroma level stabilizing signal varies as a function of the average of amplitude variations in the selected portion of said color difference signals and in a direction to stabilize chroma level,

said control means coupling said chroma level stabilizing signal to said chroma reference means to combine with said chroma reference signal and form a chroma level control signal,

said chroma reference means being coupled to said variable gain chroma amplifier to vary the gain thereof in accordance with said chroma level control signal.

4,183,048

VIR-CONTROLLED HUE CORRECTION CIRCUIT

Katsuo Isono, Kawagoe, and Seiji Sanada, Yokosuka, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 18, 1978, Ser. No. 942,817

Claims priority, application Japan, Sep. 30, 1977, 52-118428

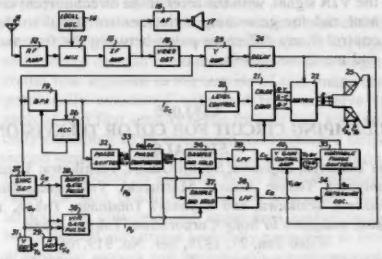
Int. Cl.[2] H04N 9/535

U.S. Cl. 358—28 **11 Claims**

1. A hue correction circuit for use in video display apparatus of the type responsive to a composite color video signal for displaying a color image corresponding thereto and wherein said composite color video signal includes luminance, chrominance and burst signals and is provided with a vertical interval reference (VIR) signal during the vertical interval thereof, said VIR signal having a chrominance reference component, said hue correction circuit comprising:

controllable oscillator means for generating a reference oscillating signal of controllable phase for use in demodulating said chrominance signal;

first phase control means responsive to said burst signal for deriving a first phase control signal as a function of the phase error between said burst signal and said reference oscillating signal, said first phase control signal being applied to said local oscillator means to vary the phase thereof for minimizing said phase error;



gain controlled amplifier means connected to receive said luminance signal and having a controllable gain for deriving a second phase control signal as a function of the level of said luminance signal, said second phase control signal being applied to said local oscillator means to vary the phase thereof; and

gain controlling means responsive to said VIR signal for supplying a gain controlling signal to said gain controlled amplifier means as a function of the phase error between said chrominance reference component of said VIR signal and said reference oscillating signal.

4,183,049

TINT CONTROL SIGNAL GENERATOR FOR COLOR TELEVISION RECEIVER

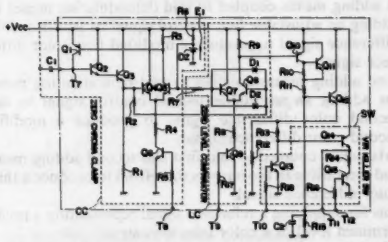
Nobukazu Hosoya, Moriguchi, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 9, 1978, Ser. No. 904,447

Claims priority, application Japan, May 9, 1977, 52-54523; Dec. 2, 1977, 52-164134[U]

Int. Cl.[2] H04N 9/535

U.S. Cl. 358—28 **8 Claims**



1. A tint control signal generator for a color television receiver set comprising means for demodulating color television signals including sync pulse information, luminance information, suppressed subcarrier chrominance information, color burst information and a VIR information, said VIR information containing chrominance reference, luminance reference and black level reference components and occurring on a predetermined line during the vertical retrace interval, and a tint control means connected in series with and forming a front

stage preceding said demodulating means, said tint control signal generator comprising:

means for clamping an appropriate output of the demodulating means to give a direct current component by the utilization of the vertical synchronizing pulses during the vertical retrace interval;

a source of a pulse having a pulse width equal to the duration of the chroma reference component of the VIR signal; and,

means operable by said pulse for comparing the level of the appropriate output of the demodulating means, generated during the duration of the chroma reference component of the VIR signal, with the level of the direct current component and for generating a tint control signal to the tint control if any difference exists between the first and second mentioned levels.

4,183,050

CLAMPING CIRCUIT FOR COLOR TELEVISION SIGNALS

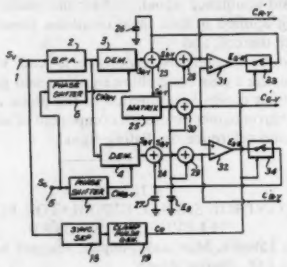
Takao Tsuchiya, Fujisawa; Shouji Omori, Tachikawa; Yasunobu Kuniyoshi, Tokyo; Atsushi Matsuzaki, Yokohama; Susumu Akazawa, Ichikawa, and Kiyonori Tominaga, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 27, 1978, Ser. No. 919,706

Claims priority, application Japan, Jun. 29, 1977, 52/77497; Jun. 30, 1977, 52/78136

Int. Cl.[2] H04N *9/535*

U.S. Cl. 358—34 **7 Claims**



1. A clamping circuit for color television signals, comprising:

demodulating means for receiving chrominance signals and for demodulating said chrominance signals to produce first and second color difference signals;

first adding means coupled to said demodulating means for adding an adjustable first control signal to said first color difference signal to produce a modified first color difference signal;

second adding means coupled to said demodulating means for adding an adjustable second control signal to said second color difference signal to produce a modified second color difference signal;

matrix means coupled to said first and second adding means and responsive to the outputs therefrom to produce a third color difference signal;

means for supplying a reference signal representing a predetermined level of a color television signal;

third adding means coupled to said first adding means for adding said reference signal to said modified first color difference signal;

fourth adding means coupled to said second adding means for adding said reference signal to said modified second color difference signal;

fifth adding means coupled to said matrix means for adding said reference signal to said third color difference signal;

first comparator means coupled to said third and fifth adding means for comparing the outputs from said third and fifth adding means to produce a first output signal as a function of the difference therebetween;

second comparator means coupled to said fourth and fifth adding means for comparing the outputs from said fourth and fifth adding means to produce a second output signal as a function of the difference therebetween;

first sampling means for sampling said first output signal at predetermined times corresponding to the times of occurrence of said predetermined level of said color television signal to produce said first control signal; and

second sampling means for sampling said second output signal at said predetermined times to produce said second control signal.

4,183,051

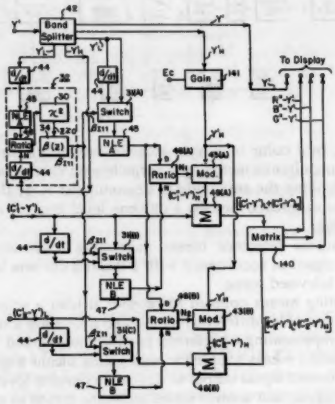
COLOR TELEVISION RECEIVING SYSTEM UTILIZING MULTIMODE INFERRED HIGHS CORRECTION TO REDUCE COLOR INFIDELITIES

Donald Richman, Huntington, N.Y., assignor to Quadricolor Technology L.P., Great Neck, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,422

Int. Cl.[2] H04N *5/21, 5/14*

U.S. Cl. 358—36 **194 Claims**



175. A television receiving system for receiving a composite NTSC-type signal comprising a wide bandwidth monochrome video signal and I′ and Q′ subcarrier modulated chrominance signals, wherein the single sideband component of the I′ signal can produce undesired cross-talk in the monochrome signal, circuit means for effectively neutralizing said cross-talk comprising:

correction circuit means responsive to said wideband monochrome signal and to said I′ chrominance signal for effectively processing an inferred cross-talk component proportional to the product of a first signal representative of a high frequency portion of the monochrome signal containing undesired cross-talk; a second signal representative of the rate-of-change of a low frequency portion of the I′ chrominance signal; and the inverse of a third signal representative of the rate-of-change of a low frequency portion of the monochrome signal;

means for modulating a derived reference chrominance subcarrier with said corrective inferred cross-talk component to effectively produce a phase inverted single sideband cross-talk neutralization signal; and

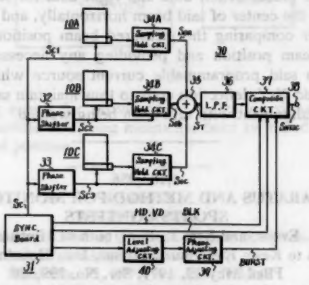
circuit means for combining said inferred cross-talk neutralization signal with the wideband monochrome signal to effectively neutralize cross-talk in signal regions adjacent chrominance step transitions.

4,183,052

SOLID STATE COLOR CAMERA

Seisuke Yamanaka, Mitaka; Fumio Nagumo, Yokohama, and Toshimichi Nishimura, Tama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 9, 1977, Ser. No. 794,804
Claims priority, application Japan, May 14, 1976, 51/55059
Int. Cl.[2] H04N 9/09
U.S. Cl. 358—50 12 Claims



1. A solid state color camera, comprising:

(a) solid state image sensing device means having a plurality of image sensing elements aligned both in horizontal and vertical directions;

(b) filter means for providing three primary color separated images on said image sensing device means;

(c) means for reading out directly an image signal as to satisfy an interlaced signal reading system of a standard broadcast television signal, said image signal being comprised of a luminance signal and a chrominance modulated carrier signal;

(d) means for supplying a carrier signal having no modulating components to said reading-out means, said carrier signal being selected approximately equal to a standard color sub-carrier frequency; and

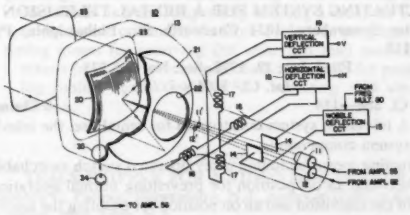
(e) means for selecting vertical and horizontal frequencies of a read-out image signal.

4,183,053

PROJECTION TYPE COLOR TELEVISION WITH A SINGLE CATHODE RAY TUBE

Kaoru Tomii, and Tadao Kohashi, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Dec. 8, 1977, Ser. No. 858,838
Claims priority, application Japan, Dec. 10, 1976, 51/149186
Int. Cl.[2] H04N 9/24
U.S. Cl. 358—60 16 Claims



11. A cathode ray tube for projection television systems including a viewing screen, comprising:

means for producing an electron beam;

a convex surface on an opaque electrically conductive support, said surface having an image area on which an image is formed and adapted for connection to a positive potential for accelerating said electron beam;

an apertured, concave reflecting mirror positioned in face-to-face relationship with said convex surface to allow said electron beam to impinge on said convex surface through the aperture thereof, said conductive support being located adjacent said concave mirror remote from said electron beam producing means to reflect the image to said viewing screen;

periodically repetitive groups of vertically oriented, light emissive stripes positioned within said image area for emission of different primary colors in response to the impingement of said electron beam;

a plurality of first sensors formed of a material emissive of ultraviolet light in response to electron beam impingement and located on said conductive support in a single horizontal row adjacent to but outside of said image area and positionally associated with said light emissive stripes, each of said first sensors being formed into a stripe vertically extending to an associated light emissive stripe; and

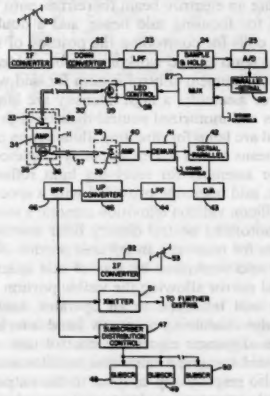
a second sensor formed of a material emissive of ultraviolet light in response to electron beam impingement and located on said conductive support extending vertically adjacent but outside of said image area, said second sensor being formed into stripes vertically extending to form part of said first sensors and horizontally equally spaced apart from each other.

4,183,054

DIGITAL, FREQUENCY-TRANSLATED, PLURAL-CHANNEL, VESTIGIAL SIDEBAND TELEVISION COMMUNICATION SYSTEM

Charles R. Patisaul; Fred R. McDevitt, both of Melbourne, Fla.; Edwin R. Tarmain, London, and Donald G. Monteith, Aylmer, both of Canada, assignors to Harris Corporation, Cleveland, Ohio

Filed Sep. 30, 1977, Ser. No. 838,091
Int. Cl.[2] H04N 7/10; H04B 7/14, 1/68; H04J 3/00
U.S. Cl. 358—86 36 Claims



13. A communication system comprising:

first means, disposed at a transmitting station and coupled to receive vestigial sideband modulation information signals at a first frequency range for shifting said vestigial sideband modulation information signals to a second frequency range lower than said first frequency range;

second means, coupled to said first means, for converting said second frequency range-shifted vestigial sideband modulation information signals into prescribed transmission signals representative thereof and causing said pre-

scribed transmission signals to be transmitted to a receiving station;

third means, disposed at said receiving station, for converting prescribed transmission signals transmitted from said second means into second frequency range-shifted vestigial sideband modulation information signals; and

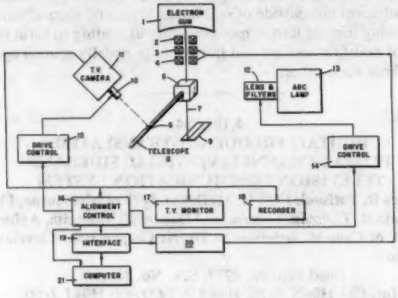
fourth means, coupled to said third means, for shifting the second frequency range-shifted vestigial sideband modulation information signals obtained by said third means to first frequency range vestigial sideband modulation information signals.

4,183,055

BEAM/SEAM ALIGNMENT CONTROL FOR ELECTRON BEAM WELDING

James H. Burkhardt, Jr., Knoxville; J. James Henry, Oak Ridge, and Clyde M. Davenport, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 24, 1978, Ser. No. 936,458
Int. Cl.[2] H06N 7/18
U.S. Cl. 358—101 **4 Claims**



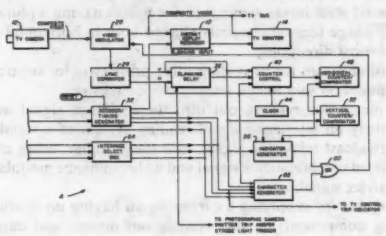
1. In an electron beam welder provided with an electron gun for directing an electron beam therefrom onto a workpiece, a focus coil for focusing said beam, and a double set of X-Y deflection coils for controlling the position of said beam with respect to a seam on said workpiece to be welded, an improved beam/seam alignment control system for said welder comprising a mirror assembly; a high intensity arc lamp; a first condenser lens and motorized neutral density filter assembly coupled to said arc lamp for directing illumination onto said workpiece by means of said mirror assembly; a telescope coupled to said mirror assembly for receiving light reflected from said workpiece, said telescope provided with a spectrally selective mirror; a silicon vidicon television camera; a second condenser lens and motorized neutral density filter assembly coupled to said camera for receiving an infrared portion of said reflected light from said workpiece by way of said spectrally selective mirror, said mirror allowing the visible portion of said light to travel out said telescope to an operator, said second filter assembly also containing a narrow band interference filter; a beam/seam alignment electronic control unit coupled to the output of said camera; a television monitor and a video tape recorder also respectively coupled to the output of said camera; a digital computer coupled to said control unit; a computer interface coupled between said control unit and said computer; a first drive control unit coupled between said electronic control unit and said first filter assembly; a second drive control unit coupled between said electronic control unit and said second filter assembly; and a programmable current source coupled between said computer interface and said X-Y deflection coils, whereby prior to a welding operation the position of said workpiece seam is stored in said computer as a function of a set marker position on said television monitor for a desired workpiece angular position, and during a subsequent operation of said welder, said electronic control unit acting in conjunction with said computer monitors the video output of said camera to first automatically generate data for controlling each of said respective drive control units for respective control of each of said filter assemblies to thus automatically maintain a peak beam level and a peak illumination level, and second when the beam has been detected the horizontal position of the left edge and right edge of the beam are determined for three different vertical positions (horizontal traces) in the beam for a predetermined video threshold level, said computer utilizing the three pieces of left data and right data for said beam to estimate the center of said beam horizontally, and finally said computer comparing the measured beam position with said stored seam position and providing any necessary control signal to said programmable current source which in turn drives said X-Y deflection coils to thus maintain said electron beam in alignment with said seam being welded.

4,183,056

APPARATUS AND METHOD FOR MONITORING SPORTS CONTESTS

James D. Evans, and Sam L. Pool, both of Houston, Tex., assignors to Kewp Electronic Systems, Inc., Houston, Tex.

Filed May 23, 1977, Ser. No. 799,539
Int. Cl.[2] H04N 7/18; G03B 23/00
U.S. Cl. 358—108 **24 Claims**



1. An apparatus for controlling the operation of a television system, which includes a replay recorder at sports contests to monitor events of interest during the contests, comprising:

(a) means for receiving a signal indicating occurrence of an event of interest;

(b) means for forming a signal for transfer to the replay recorder indicating occurrence of the event of interest; and

(c) means for generating an indicator mark for provision to the replay recorder indicating the time of occurrence of the event of interest.

4,183,057

ACTUATING SYSTEM FOR A RENTAL TELEVISION

Charles Sonnenberg, 1031 Chesworth St., Philadelphia, Pa. 19115

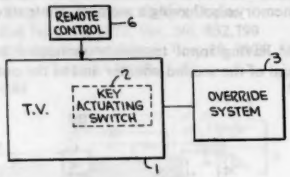
Filed Jun. 19, 1978, Ser. No. 916,521
Int. Cl.[2] H04N 7/16
U.S. Cl. 358—114 **6 Claims**

1. A television system constructed for rental use, the television system comprising:

actuating means including a key operated switch switchable between an off position for preventing normal operation of the television and an on position for enabling the television to be operated;

override switching means capable of being switched from a normal position to an actuated position for overriding said key operated switch when in its off position and enabling the television to be operated; and said override switching means when switched in to its actuated position remains in

said position until said key operated switch is switched into its on position; and



indicating means for providing an indicating signal when said override switching means has been switched into its actuated position.

4,183,058

VIDEO STORE

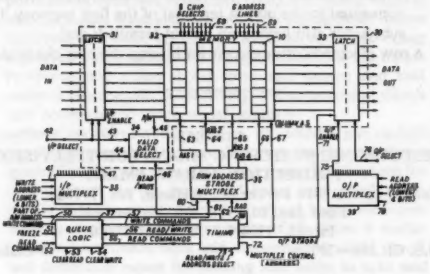
Richard J. Taylor, London, England, assignor to Micro Consultants, Limited, Berkshire, England

Filed Jan. 31, 1977, Ser. No. 764,148

Claims priority, application United Kingdom, Feb. 19, 1976, 6585/76

Int. Cl.[2] H04N *5/76*

U.S. Cl. 358—127 **13 Claims**



1. A video data store capable of asynchronous operation to allow data write in and read out from the video store to be effected at times unrelated to each other, said video data store comprising:

at least one storage device containing a plurality of storage elements;

at least one input data latch for holding incoming data until access to said storage device is gained;

at least one output data latch for holding outgoing data from the storage device after access is gained;

queueing control means for receiving write and read store commands and for temporarily holding a received write or read store command if a store cycle is in progress; and

timing means for receiving the write and read store commands from said queueing control means and for producing timing signals required for accessing said storage device.

4,183,059

TRACK SKIPPER FOR A VIDEO DISC PLAYER

Richard C. Palmer, Blawenburg, N.J., assignor to RCA Corporation, New York, N.Y.

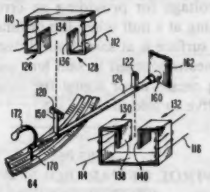
Filed May 22, 1978, Ser. No. 908,515

Int. Cl.[2] G11B *21/08, 3/38*

U.S. Cl. 358—128 **11 Claims**

1. In a system for recovering prerecorded information from a disc record having a spiral information track by a track-following stylus when stylus/record relative velocity is established; wherein normal operation of said system involves sensing of said prerecorded information along successive convolutions of said spiral track in a regular progression toward one extremity; a combination comprising:

(A) a stylus arm having a longitudinal axis, and carrying said track-following stylus at one end thereof;



(B) means for yieldably supporting the end of said stylus arm remote from said one end; and

(C) selectively actuated means for twisting said stylus arm about said longitudinal axis thereof to cause a shift in the radial location of said track-following stylus.

4,183,060

CAPACITANCE DISTANCE SENSOR APPARATUS FOR VIDEO DISC PLAYER/RECORDER

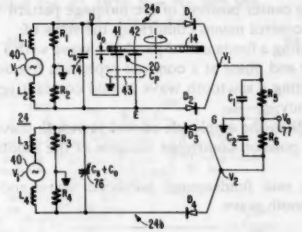
William E. Barnette, Levittown, Pa., and Fred W. Spong, Lawrenceville, N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 777,476, Mar. 14, 1977, abandoned. This application Sep. 14, 1978, Ser. No. 942,183

Claims priority, application United Kingdom, Mar. 19, 1976, 11122/76

Int. Cl.[2] H04N *5/76*; G11B *21/20, 17/32*

U.S. Cl. 358—128 **6 Claims**



1. An apparatus for use in an optical video disc playback and recording system for maintaining an objective lens relative to a surface of the disc at a desired distance; said apparatus comprising:

a probe having a first and second coplanar electrode, said probe being connected to a first end of said objective lens, said probe and said disc forming a capacitance element, the capacitance of said element being a function of the distance between said lens and said surface;

means coupled to each of said first and second electrodes of said probe for maintaining said first electrode at an rf potential that is equal in magnitude and opposite in polarity to the rf potential of said second electrode;

a first resonant circuit, having a net capacitance including said capacitance element, said first resonant circuit having a given resonant frequency, for providing an output voltage at a given polarity;

a second resonant circuit, having a net capacitance equal to the net capacitance of said first resonant circuit when the distance between said lens and said surface is at said desired distance, said second resonant circuit having said

given resonant frequency for providing an output voltage at a fixed reference voltage level but of a polarity opposite to said given polarity;

a single source of rf signals coupled to said first and to said second resonant circuits for providing rf signals at a frequency above said given resonant frequency;

means for summing said first and second resonant circuit output voltage for providing an error signal, said error signal being at a null when the distance between said lens and said surface is at said desired distance; and

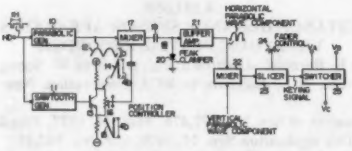
actuating means coupled to said lens and responsive to said summing means error signal for axially positioning said lens relative to said disc.

4,183,061

PHASE CONTROL OF PARABOLIC WAVE IN SPECIAL EFFECTS SYSTEM

Kazuhiko Miyake, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 2, 1978, Ser. No. 874,517
Claims priority, application Japan, Feb. 4, 1977, 52-11485
Int. Cl.[2] H04N *5/22*
U.S. Cl. 358—183 **29 Claims**



1. A method for controlling the phase of a continuous parabolic wave for use in provision of a circular or elliptical montage pattern on the screen of a television cathode ray tube to move the center position of the montage pattern by means of position control means comprising the steps of:

generating a fundamental parabolic wave with a fixed amplitude and phase at a constant repetition frequency;

generating a sawtooth wave at said constant repetition frequency;

controlling the amplitude of said sawtooth wave according to a position controlled variable of the montage pattern; and

mixing said fundamental parabolic wave and controlled sawtooth wave.

4,183,062

ROW ADDRESSING APPARATUS FOR A BISTABLE DISPLAY DEVICE

Sherman Weisbrod, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 7, 1978, Ser. No. 931,745
Int. Cl.[2] H04N *5/66, 3/12;* H05B *37/00;* G09F *9/00*
U.S. Cl. 358—230 **8 Claims**

1. A device for addressing row electrodes in a bistable image display apparatus capable of displaying a television signal having a horizontal sync signal comprising:

a first memory device having address locations and having an addressing input terminal and an output terminal for the contents of said address locations;

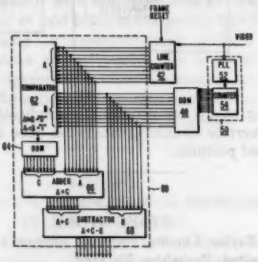
means for addressing the first memory device with the horizontal sync signal;

a second counter having an input terminal addressed by the horizontal sync signal for counting the pulses of said sync signal, the second counter having an output terminal;

a comparator having one input terminal connected to the output of the second counter and another input terminal connected to the output of the first memory for comparing the contents of the first memory to the count of the counter, the comparator also having an output terminal;

a second memory having an addressing input terminal connected to the output terminal of the comparator, the second memory also having a memory contents output terminal;

an adder having input terminals connected to the output terminal of the second counter and to the output terminal



of the second memory, for summing the count of the second counter with the contents of the second memory, the adder having a summation output terminal;

a subtractor having a first input terminal connected to the output terminal of the adder and a second input terminal connected to the output terminal of the first memory, the subtractor also having an output terminal; and

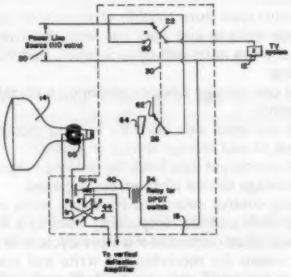
a row electrode drive circuit for biasing the row electrodes.

4,183,063

ELECTRONIC SWITCHING MEANS FOR TELEVISION PROJECTION ARRANGEMENT

Earl C. Lewis, 1416 Parker St., Midland, Tex. 79701

Filed Jun. 26, 1978, Ser. No. 918,864
Int. Cl.[2] H04N *5/74;* H01J *31/10*
U.S. Cl. 358—237 **9 Claims**



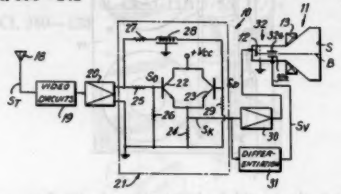
1. System for selectively reversing the deflection sweep to the yoke coil of a television receiver and having a network for being interposed in the power line supply to a television receiver and in its vertical deflection yoke coil drive unit comprising a double pole-double throw (DP-DT) switch connected between a vertical deflection yoke coil of the television receiver and a vertical deflection amplifier of the television receiver, a solenoid relay when energized for switching the DP-DT switch from a given position to a holding position and switch means in the network for energizing the solenoid relay into its holding position in absence of energizing a remaining part of the television receiver.

4,183,064

VIDEO SIGNAL REPRODUCING APPARATUS WITH ELECTRON BEAM SCANNING VELOCITY MODULATION

Hiroshi Sahara, and Yutaka Tanaka, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 18, 1977, Ser. No. 852,790
Claims priority, application Japan, Nov. 29, 1976, 51-143118
Int. Cl.[2] H04N 5/63
U.S. Cl. 358—242 9 Claims



1. A video signal reproducing apparatus comprising

a source of a video signal representing at least the brightness of a video picture and in which bright picture portions are represented by video signal portions of high level defined between respective rising and falling edges;

waveshaping means receiving said video signal from said source for providing a corresponding compensated video signal in which the width of each of said high level signal portions between said respective rising and falling edges is increased, said wave shaping means including delay means receiving said video signal from said source for providing a delayed video signal, and OR gate means having inputs receiving said video signal from said source and said delayed video signal, respectively, and an output at which said compensated video signal appears;

a cathode ray tube having a screen, an electron gun including beam producing means directing an electron beam generally along the axis of the tube toward said screen for impingement on the latter and being controlled in response to said compensated video signal from said waveshaping means so that the intensity of the beam is modulated in accordance with said compensated video signal, and deflection means for causing said beam to scan said screen in line-scanning and vertical directions, respectively;

detecting means also receiving said compensated video signal from said waveshaping means and detecting said rising and falling edges of the high level signal portions of said compensated video signal for providing output signals in correspondence to the detected rising and falling edges; and

beam velocity modulation means for modulating the scanning velocity of said electron beam in said line-scanning direction in accordance with said output signals from said detecting means.

4,183,065

VIDEO RECORDING APPARATUS WHICH SAMPLES AND QUANTIZES LOW FREQUENCIES AND THEN GROUPS AND RECORDS AN ANALOG REPRESENTATION THEREOF

Harvey E. Rhody, Fairport; Frederic H. Metildi, Penfield, and Edward M. Granger, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 669,923, Mar. 24, 1976, abandoned.
This application Oct. 16, 1978, Ser. No. 951,424
Int. Cl.[2] H04N 5/79, 5/795
U.S. Cl. 360—9 2 Claims

1. Apparatus for recording a television signal comprising:

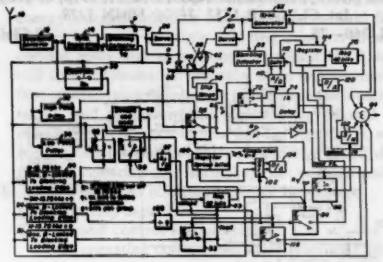
(a) means for dividing said signal into high and low frequency bands;

(b) means for receiving said low frequency band for time compressing said low frequency band;

(c) means for recording on a magnetic medium first said high frequency band and then said time compressed low frequency band;

said means for time compressing said low frequency band comprising:

(a) means for sampling said low frequency band at a predetermined rate;



(b) means for quantizing said signals;

(c) means for grouping the bits which comprise said quantized samples;

(d) means for converting said grouped bits to analog representations of said grouped bits; and

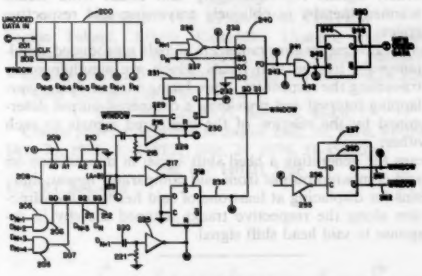
(e) means for applying said analog representations of said grouped bits to said magnetic medium.

4,183,066

TECHNIQUE FOR RECORDING DATA ON MAGNETIC DISKS AT PLURAL DENSITIES

Albert L. Anderson, Lexington, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 17, 1978, Ser. No. 925,596
Int. Cl.[2] G11B 5/09
U.S. Cl. 360—40 12 Claims



1. A self-clocking method for recording binary data sequentially in successive clock bit cells on a storage medium wherein a logical first bit state is recorded as a signal transition positioned approximately at the center of its respective bit cell and a logical second bit state is recorded as an absence of a signal transition in its respective bit cell and a signal transition is normally recorded at the bit cell boundary between two successive second bit states, comprising the steps of:

(a) detecting the occurence of a data sequence consisting of a second bit state followed by four first bit states, followed by a second bit state, and

(b) recording said data sequence on said medium as a signal transition sequence consisting of six bit cells having signal transitions at the bit cell boundary between the first and

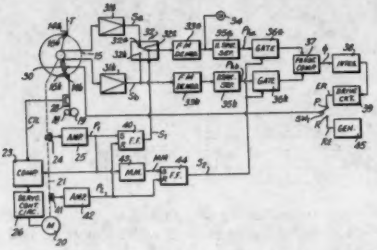
second bit cells, the third and fourth bit cells and the fifth and sixth bit cells.

4,183,067

HELICAL SCAN VTR WITH MEANS FOR DISPLACING HEAD ALONG TRACK DIRECTION

Nobutoshi Kihara, Tokyo, and Yoshimi Watanabe, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 19, 1977, Ser. No. 862,052
Claims priority, application Japan, Dec. 23, 1976, 51-155243
Int. Cl.[2] G11B 5/52, 21/04; H04N 5/78
U.S. Cl. 360—75 19 Claims



1. Appparatus for reproducing signals recorded in parallel tracks extending obliquely on a magnetic tape in a plurality of different longitudinal zones which divide the width of said tape, said apparatus comprising:

a plurality of rotary magnetic heads respectively corresponding to said zones and obliquely traversing the respective zones of the tape in a repeating cyclic order wherein each head transverses said magnetic tape commencing substantially at one boundary and ending substantially at another boundary of said respective zone, and having at least one overlapping interval in which two of said heads are simultaneously traversing said respective zones;

means for sequentially combining, in said repeating cyclic order, signals reproduced by said heads from tracks scanned thereby in obliquely traversing said respective zones;

comparator means for comparing signals reproduced simultaneously by the two heads which are simultaneously traversing the respective zones during each said one overlapping interval and providing a compared output determined by the relation of the compared signals to each other;

means for generating a head shift signal in dependence on said compared output from said comparator means; and

means for displacing at least one of said heads in the direction along the respective tracks scanned thereby in response to said head shift signal.

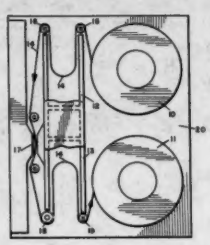
4,183,068

MAGNETIC TAPE TRANSPORT MECHANISM

William M. Barton, Jr., San Diego, Calif., assignor to Cipher Data Products, Incorporated, San Diego, Calif.

Filed Aug. 31, 1978, Ser. No. 938,429
Int. Cl.[2] G11B 15/58
U.S. Cl. 360—90 7 Claims

1. A magnetic tape drive comprising a cabinet having a face containing a pair of tape reels, a read/write head, a capstan, a first vacuum column, and a second vacuum column; each of said vacuum columns having an elongated body, an open end for receiving a loop of magnetic tape from a respective one of said tape reels, and a closed end; wherein said first vacuum column is positioned substantially perpendicular to said second vacuum column, said capstan is positioned at the open end of said first vacuum column, said read/write head is positioned along the body portion of said first vacuum column, and the open end of said second vacuum column is positioned spaced apart from the closed end of said first vacuum column, the forward direction of said tape being from said second vacuum



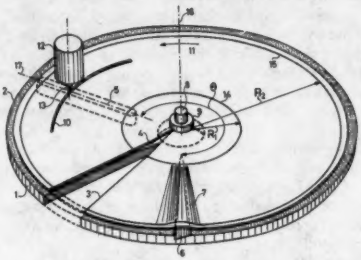
column then along said body portion of said first vacuum column and then around said capstan to said first vacuum column with no direction changing rollers lying between the entrance of said vacuum column and exit of said first vacuum column to limit the acceleration of said tape.

4,183,069

SUPPORT APPARATUS FOR A FLEXIBLE DISC AND DISC READER USING THIS SUPPORT APPARATUS

Gérald Roullet; Jean-Pierre Bortuzzo, and Serge Chevalier, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Jun. 27, 1978, Ser. No. 919,547
Claims priority, application France, Jul. 1, 1977, 77 20374
Int. Cl.[2] G11B 5/60, 17/32
U.S. Cl. 360—102 15 Claims



1. A support apparatus for a flexible disc that produces an air bearing when said flexible disc is rotated; said flexible disc being provided on at least one of its faces with an annular band reserved for the storage of information and with a hole intended to receive a drive spindle; said support apparatus comprising a fixed stabilizing plate having a sliding surface such that said annular band retains its flatness when it supports said disc in its stationary position and air intake means; said flexible disc being rotated near said fixed stabilizing plate for drawing air through said air intake means to form an air bearing support of said flexible disc relative to said fixed stabilizing plate; said sliding surface being locally depressed for improving the floating of said flexible disc and being free from any irregularity capable of adversely affecting the flatness of said annular band in a major sector of said disc; said information being explored along a line; said sliding surface having in the zone situated below said annular band at least one depression oriented radially and situated in a sector remote from said line.

4,183,070

ELECTROMAGNET FOR DEGAUSSING RECORD-REPRODUCE HEADS

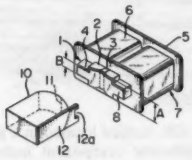
Motoyoshi Fujita, Chiba, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1978, Ser. No. 896,776

Claims priority, application Japan, Sep. 21, 1977, 52/126101[U]

Int. Cl.[2] G11B 5/46, 27/24

U.S. Cl. 360—128 **4 Claims**



1. In a demagnetizer for a magnetic head of a recording-reproducing device, which demagnetizer includes an electromagnet for producing a varying magnetic field, the improvement in which said electromagnet comprises a yoke having a yoke face with a gap therein designed for interacting magnetically with said magnetic head, the middle portion of said yoke face, at and adjacent to said gap, being wider than the side portions of said face away from said gap thereby to effect an enhanced magnetic interaction.

4,183,071

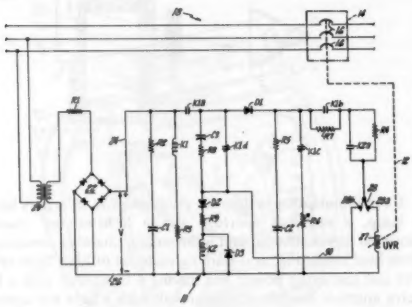
CONTROL CIRCUIT FOR RESETTING CIRCUIT BREAKER UVR SOLENOID

Ronald R. Russell, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,623

Int. Cl.[2] H02H 3/24

U.S. Cl. 361—59 **9 Claims**



1. A circuit for controlling an undervoltage release (UVR) solenoid having a plunger mechanically coupled to trip a circuit breaker in response to an undervoltage condition, said circuit including, in combination:

A. first and second buses having input ends coupled to the distribution system pursuant for developing thereacross a DC control voltage proportional to the system voltage;

B. a first control relay having an operating coil connected between said first and second buses to be actuated by said control voltage so long as said system voltage remains above a predetermined minimum level, said first control relay further including normally open first contacts connected in said first bus downstream from said first control relay operating coil;

C. the series combination of a dropping resistor and the UVR solenoid coil connected across said first and second buses downstream from said first contacts of said first control relay, whereby actuation of said first control relay closes its first contacts to apply said control voltage across said series combination pursuant to developing sufficient holding voltage across the UVR solenoid coil to hold its plunger in and thus preclude tripping of the circuit breaker;

D. a UVR solenoid drop-out delay network including an energy storage capacitor connected across said first and second buses intermediate said first contacts of said first control relay and said dropping resistor-UVR solenoid coil series combination whereby upon deactuation of said first control relay in response to the system voltage falling below said predetermined minimum level, said energy storage capacitor discharges through the UVR solenoid coil to hold its plunger in for a predetermined duration pending restoration of normal system voltage; and

E. a UVR solenoid resetting network including

(1) a resetting capacitor,

(2) a second control relay having

(a) an operating coil connected in series with said resetting capacitor across said first and second buses downstream from said first contacts of said first control relay, and

(b) normally open contacts connected in shunt with said dropping resistor,

(3) whereby, upon restoration of normal system voltage following tripping of the circuit breaker by the UVR solenoid in response to a protracted undervoltage condition, said first control relay is actuated to close its first contacts and said resetting capacitor begins charging toward the control voltage, the charging current temporarily actuates said second control relay to close its contacts shunting said dropping resistor such that full control voltage is applied across the UVR solenoid coil for the interval required to substantially charge said resetting capacitor to insure magnetic attraction of the UVR plunger to the reset position.

4,183,072

PROTECTIVE RELAYING SYSTEM

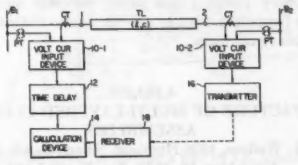
Toshio Takagi, Tokyo; Katsuhiko Uemura, and Toshiaki Sakaguchi, both of Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and The Tokyo Electric Power Co., Inc., both of, Japan

Filed Dec. 23, 1977, Ser. No. 863,677

Claims priority, application Japan, Dec. 29, 1976, 51-158128; Dec. 29, 1976, 51-158131; Dec. 29, 1976, 51-158132

Int. Cl.[2] H02H 3/28

U.S. Cl. 361—68 **5 Claims**



1. A protective relaying system, comprising: a protected AC transmission line having a pair of line ends and defining a propagation path for a traveling wave propagating along said transmission line between said line ends for a surge propagation time τ; and detection means for detecting a change in

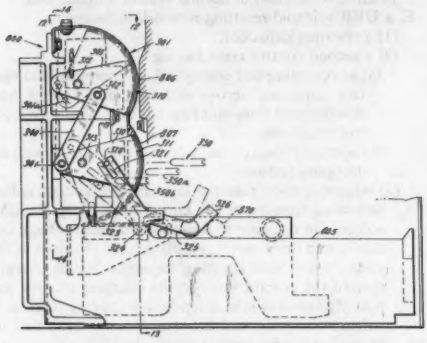
propagation mode of the traveling wave due to a transmission line fault, wherein said detection means is effective for comparing a value of the traveling wave as it passes one of the line ends at time $t-\tau$ and a value of the traveling wave as it passes the other of the line ends at time t after the surge propagation time has elapsed for detecting a change in wave value resulting from a change in wave propagation mode.

4,183,073

SHUTTER FOR DISCONNECT CONTACTS OF CIRCUIT BREAKER CUBICLE

Challiss I. Clausing, Marlton, N.J., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jul. 12, 1978, Ser. No. 923,908
Int. Cl.[2] H02B *1/14*
U.S. Cl. 361—345 **9 Claims**



1. A circuit breaker compartment having a front through which a circuit breaker may be inserted and removed;

a plurality of stationary disconnect members at the rear of said compartment comprising at least one upper stationary disconnect contact and at least one lower stationary disconnect contact;

a shutter structure at the rear of said compartment comprising a clam-shell arrangement of a pair of shutter halves;

one of said clam-shell halves being pivotally mounted to extend across the rear of said compartment in front of said upper stationary disconnect contact;

the second of said clam-shell halves being pivotally mounted to extend across the rear of said compartment in front of said lower stationary disconnect contact means connecting said halves together so that they are simultaneously movable;

said clam-shell halves being movable simultaneously toward each other to be positioned in front of their respective stationary contacts and being movable simultaneously away from each other to provide access to their respective stationary contacts.

4,183,074

MANUFACTURE OF MULTI-LAYERED ELECTRICAL ASSEMBLIES

Clarence L. Wallace, 1036 Highland, Solana Beach, Calif. 92075

Filed May 16, 1977, Ser. No. 797,193
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—402 **1 Claim**

1. An electrical assembly comprising

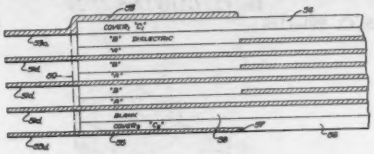
(a) a first stack of laminar components,

(b) a second stack of laminar components,

(c) said stack including laminar elements forming electrical elements consisting of stabilized ink, the electrical elements of the two stacks being connected at one end at least of each stack,

(d) each electrical element selected from the group that includes resistance, capacitance and inductance,

(e) said laminar components including dielectric components, the electrical elements embedded in associated dielectric components excepting for end portions of the electrical elements that protrude beyond the ends of the dielectric components, each dielectric component formed as a unitary layer so that the electrical element has only



one exposed side surface located in a plane formed by its associated dielectric component material adjacent two spaced apart edges of the electrical element and adjacent one end of the electrical element remote from said end portion,

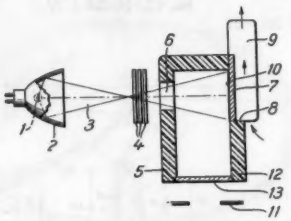
(f) the said protruding end portions of the stabilizer ink electrical elements being connected as defined, said connected end portions characterized as fused together adjacent said ends of the stacks.

4,183,075

ILLUMINATION SYSTEM FOR PHOTOGRAPHIC ENLARGERS

Alfred Hengst, Wetzlar, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 897,196
Claims priority, application Fed. Rep. of Germany, May 4, 1977, 7714074[U]
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—6 **11 Claims**



1. An illumination system for photographic enlargers having a lamp, a negative aperture and a light-mixing chamber mounted therebetween, said light-mixing chamber constructed from heat insulating, non-staining material of high light reflective and scattering power and having a front wall with a light entry aperture therein, a bottom wall with a light exit aperture therein and a rear wall with another aperture therein, said another aperture having a wall segment inserted therein for cooling said light-mixing chamber and said wall segment comprised of a material having a greater heat conductivity than said material.

4,183,076

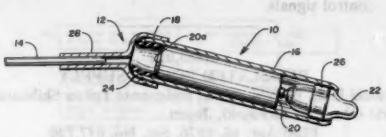
LIGHT INDICATOR FOR FISHING TIP-UPS

Egbert J. Bodde, Rte. 1, Trego, Wis. 54888

Filed Jun. 23, 1978, Ser. No. 918,641
Int. Cl.[2] B25B *23/18*
U.S. Cl. 362—120 **11 Claims**

1. A fish bite indicator to be carried and energized by the signal arm of an ice fishing rig having a normal "baited" position and a substantially upright "bite" signaling position, the

bite indicator comprising a flashlight including a housing having at least a portion thereof electrically conductive; a normally de-energized bulb electrically contacting the conductive portion of the housing; a battery in the housing cooperating with the bulb; a closure member at one end of the housing having at least a portion thereof electrically conductive and in contact with the conductive portion of the housing; means electrically insulating the conductive portionof the closure member from the battery, and a combination mounting and contact guide means, at least a portion of which is electrically conductive and in contact with the conductive portion of the



closure member, the guide means leading to the end of the battery through the closure member and extending outwardly from the closure member away from the battery end for removably and slidably mounting the flashlight on a conductive tip carried by the signal arm of the rig, the guide means electrically contacting the tip by means of the conductive portion of the guide means and being so oriented relative to the flashlight that the flashlight slides downwardly on the signal arm when it is in the "bite" position bringing the end of the battery into electrical contact with the tip whereby an electrical circuit between the battery and bulb is completed and the bulb is energized.

4,183,077

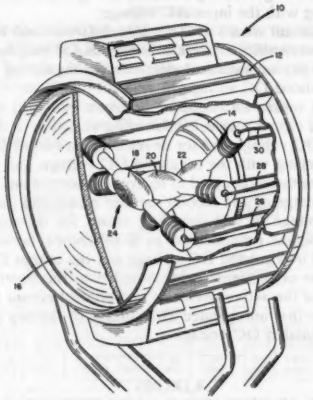
LIGHT PROJECTOR

August Arnold, Turkenstrasse 89, 8 Munich 40, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 668,631, Jun. 8, 1976, abandoned. This application May 24, 1978, Ser. No. 908,924

Int. Cl.[2] F21S *3/00*

U.S. Cl. 362—224 **11 Claims**



1. A high-intensity light projector of the type for use in a motion picture studio or the like, comprising: a housing having a rear portion closed by a reflector and a front portion closed by a Fresnel lens, at least two linear light sources disposed intermediate said reflector and said lens and at right angles to the optical axis as defined by said lens and said reflector, wherein said light sources are arranged one in front of another and wherein the longitudinal axis of each light source is at an angle with the longitudinal axis of the adjacent light source, and each of said light sources being electrically connected to one phase of a three-phase electrical power network.

4,183,078

APPROACH SLOPE INDICATORS

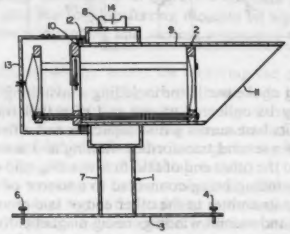
Samuel M. Kidd, Bedford, England, assignor to National Research Development Corporation, London, England

Filed Sep. 22, 1977, Ser. No. 835,849

Claims priority, application United Kingdom, Sep. 27, 1976, 40062/76

Int. Cl.[2] B64F *1/20*; G08G *5/00*

U.S. Cl. 362—231 **15 Claims**



1. An approach slope indicator unit comprising a plurality of projection tubes, a corresponding number of projectors, each mounted in a projection tube, a support assembly carrying said projection tubes said projectors each comprising a light source, a divergent lens and a connector having a first and second ends, said light source immovably mounted at said first end of said connector and said divergent lens immovably mounted at said second end of said connector and including a color filter fixed between said first and second ends of said connector, each said projector pre-aligned to produce a split beam of light of two colors and slidably insertable into said projection tubes.

4,183,079

DC-AC INVERTER

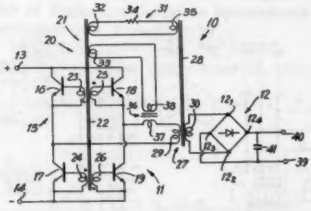
Shigeaki Wachi, Tokyo, Japan, assignor to Sony Corporaton, Tokyo, Japan

Filed Jun. 29, 1978, Ser. No. 920,463

Claims priority, application Japan, Jul. 5, 1977, 52-80258

Int. Cl.[2] H02M *3/335*

U.S. Cl. 363—17 **8 Claims**



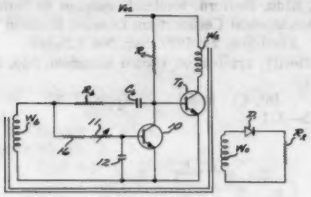
1. In a DC-AC inverter having a pair of DC input terminals, switching means connected between said DC input terminals, control means including an oscillation transformer for controlling said switching means, AC output means connected to said switching means, and feedback means connected between said AC output means and said control means; the improvement of said oscillation transformer including a core of a first core material with a large saturation magnetic flux density and a large magnetic permeability, and of a second core material having a high Curie temperature.

4,183,080

DC TO DC CONVERTER

Theodore Liebman, 350 E. Tioga, Philadelphia, Pa. 19134

Filed Jun. 21, 1978, Ser. No. 917,466
Int. Cl.[2] H02M *3/335*
U.S. Cl. 363—18 **7 Claims**



1. In a ring choke oscillator including a switching transistor connected by its collector to one end of a first transformer winding, by its base across a first capacitor and a first resistor to one end of a second transformer winding and across a biasing resistor to the other end of said first winding said other end of said first winding being connected to a source of electrical signal, and by its emitter to the other end of said second winding, said first and second windings being magnetically coupled to a third winding connected across a first load, the improvement comprising:

a control transistor connected by its collector to the base of said switching transistor and by its emitter to the emitter of said switching transistor;

a second capacitor connected between the base and emitter of said control transistor; and

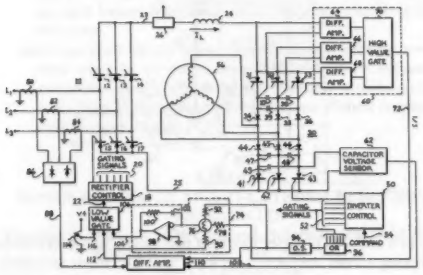
a resistor connected between said one end of said second winding and the base of said control transistor, whereby said second capacitor is charged and discharged through said second resistor according to the electrical potential across said second winding relative the charge on said second capacitor to periodically render said control transistor conductive and thereby render said switching transistor non-conductive.

4,183,081

INVERTER SYSTEM INCLUDING COMMUTATION FAILURE PREVENTION SCHEME

John H. Cutler, Roanoke, and Loren H. Walker, Salem, both of Va., assignors to General Electric Company, Salem, Va.

Filed Nov. 2, 1978, Ser. No. 957,108
Int. Cl.[2] H02P *13/24;* **H02M** *1/06*
U.S. Cl. 363—81 **16 Claims**



1. A power conversion system comprising:

(a) a source of direct current power capable of providing an output current of controllable magnitude;

(b) control means for controlling the magnitude of the said output current in response to input control signals;

(c) an inverter circuit comprising a plurality of controlled rectifiers and a plurality of associated commutating capacitors;

(d) control means for said inverter circuit;

(e) means for providing a first signal representative of the value of the voltages across said capacitors;

(f) means for providing a second signal proportional to the value of said output current; and,

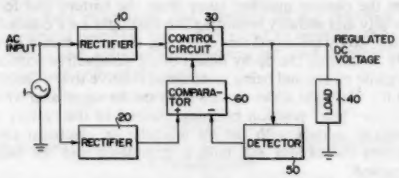
(g) overriding control means responsive to said first and second signals to develop a dominant input control signal to said control means for controlling said output current under prescribed relationships of said first and second control signals.

4,183,082

REGULATED POWER SUPPLY

Shouichi Ishii, Warabi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 16, 1976, Ser. No. 677,720
Claims priority, application Japan, Apr. 21, 1975, 50-48394
Int. Cl.[2] H02M *7/217*
U.S. Cl. 363—89 **6 Claims**



1. A power source for an audio amplifier for providing to a load a regulated DC voltage of substantially constant level irrespective of variations in load current, the constant level depending on an input AC voltage, and comprising:

first rectifier means connected to receive the input AC voltage for generating a first unregulated DC voltage varying with the input AC voltage;

second rectifier means connected to receive the input AC voltage for generating a second unregulated DC voltage varying with the input AC voltage;

control circuit means DC coupled between said load and said first rectifier means and comprising at least one active device having a control electrode for regulating the first unregulated DC voltage;

detecting means DC coupled between said load and said control circuit means for detecting variation in the regulated DC voltage and for developing an output DC voltage varying with the regulated DC voltage; and

comparing means coupled to receive the second unregulated DC voltage of said second rectifier means and the output DC voltage of said detecting means for developing an error signal proportional to a difference between the second unregulated DC voltage and the output DC voltage, the error signal being coupled to the control electrode of the active device in said control circuit to regulate the first unregulated DC voltage to thereby produce the regulated DC voltage.

4,183,083

METHOD OF OPERATING A MULTIPROGRAMMED COMPUTING SYSTEM

Glen F. Chatfield, Bethel Park, Pa., assignor to Duquesne Systems, Inc., Pittsburgh, Pa.

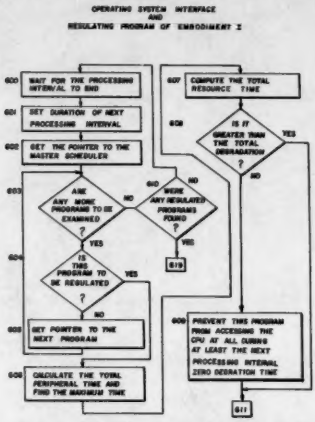
Filed Apr. 14, 1972, Ser. No. 243,951
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—200 **14 Claims**

1. A method of operating a computing system upon more than one processing program concurrently for improving total resource utilization, said computing system comprising at least

one central processing unit, having a logic and main memory function and an interrupt capability, and a plurality of peripheral resources capable of functioning in parallel with the central processing unit, comprising steps for:

(1) accumulating system utilization data for at least one processing program for at least one resource, said system utilization data comprising resource activity and/or resource degradation data;

(2)(*a*) at spaced intervals interrupting the processing programs and analyzing the system utilization of at least one processing program;


OPERATING SYSTEM INTERFACE AND REGULATING PROGRAM OF EMBODIMENT I
600 WAIT FOR THE PROCESSING INTERVAL TO END
601 SET DURATION OF NEXT PROCESSING INTERVAL
602 SET THE POINTER TO THE MASTER SCHEDULER
603 ARE ANY MORE PROGRAMS TO BE EXAMINED ?
604 IS THIS PROGRAM TO BE REGULATED ?
605 SET POINTER TO THE NEXT PROGRAM
606 CALCULATE THE TOTAL PERIPHERAL TIME AND FIND THE MAXIMUM TIME
607 COMPUTE THE TOTAL RESOURCE TIME
608 IS IT GREATER THAN THE TOTAL DEGRADATION ?
609 WERE ANY REGULATED PROGRAMS FOUND ?
610 PREVENT THIS PROGRAM FROM ACCESSING THE CPU AT ALL DURING AT LEAST THE NEXT PROCESSING INTERVAL ZERO DEGRADATION TIME
611
YES
NO

(2)(*b*) based on this analysis regulating resource access by assigning an individual resource access priority and/or preventing resource access altogether in an unlike manner to at least two resources for at least one processing program to increase thruput;

(3) resuming the operation of the computing systems on the processing programs; and,

(4) continually repeating steps (1) to (3).

4,183,084

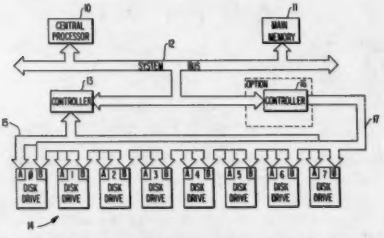
SECONDARY STORAGE FACILITY WITH SERIAL TRANSFER OF CONTROL MESSAGES

Roger E. Lawson, Northboro, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 6, 1977, Ser. No. 804,171

Int. Cl.[2] G06F *13/04*

U.S. Cl. 364—200 **8 Claims**



1. A drive for use in a secondary storage facility that includes a controller for controlling the operation of said drive and a drive bus for conveying signals between said drive and the controller, the controller including means for transferring digital data bit signals in serial form to and from a data line of the drive bus, means for transmitting a writing control signal onto a write gate line of the drive bus when a digital data transfer is to be made from the controller to said drive, means for transmitting to the drive over a message line of the drive bus control message bit signals in serial form for initiating a transfer of digital data and means for generating a strobing signal onto a strobe line of the drive bus when said control message transmitting means initiates a transmission of the control message, and wherein the controller transmits a direction control signal during the transfer of a message from the controller to said drive over a controller-to-drive line, said drive comprising:

A. a storage medium,

B. reading and writing means for retrieving data bit signals from and transferring data bit signals to said storage medium in serial form,

C. data path means connected to said reading and writing means and connectible to the drive bus data line and the write gate line for transferring the data bit signals serially between said reading and writing means and the bus data line,

D. interfacing storage means for receiving the control message bit signals from the drive bus message line in serial form and for receiving the strobing signal from the drive bus strobe line, said interfacing means including:

i. receivers for coupling the message bit signals from the drive bus into said interfacing means,

ii. means responsive to the strobing signal and the direction control signal for enabling said receivers,

iii. shift register means enabled by the strobing signal for receiving the serial control message bit signals from the drive bus message line,

iv. decoding means responsive to the drive selection information in the control message for generating a DRIVE SELECTED signal that enables said drive to respond to further signals in the control message, and

v. means responsive to the strobing signal from the drive bus strobe line for causing said decoding means to generate the DRIVE SELECTED signal,

E. the drive being characterized by a drive identification number and the control message including drive selection information, and

F. control means connected to said interfacing storage means and to said data path means and responsive to the strobing signal and a control message at said interfacing means for enabling the serial transfer of digital data bit signals between the drive bus data line and said storage medium through said reading and writing means and said data path means.

4,183,085

PROTECTION OF DATA PROCESSING SYSTEM AGAINST UNAUTHORIZED PROGRAMS

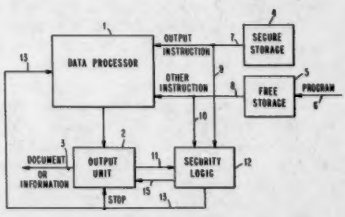
David J. Roberts, Eastleigh, and John Simmons, Chandlers Ford, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 21, 1977, Ser. No. 844,341

Claims priority, application United Kingdom, Nov. 18, 1976, 48195/76

Int. Cl.[2] G06K *5/00, 7/00*

U.S. Cl. 364—200 **6 Claims**



3. In a data processing system operating an output unit for issuing value documents, means for preventing the issuance of

value documents from the output unit by execution of output instructions from an unauthorized source, comprising

a special storage area which cannot be modified by a system user being an authorized source for output instructions,

means for detecting when the current instruction being executed by the data processing system is an output instruction for actuating the output unit to issue a value document and providing an output instruction signal,

sensing means for indicating whether or not the current instruction was accessed in the special storage area and providing an authorization signal,

means for stopping the output unit from issuing the value document in response to no authorization signal being provided from the sensing means while the detecting means is providing an output instruction signal,

whereby the stopping means indicates when the output instruction did not derive from the special storage area and prohibits issuance of the value document.

4,183,086

COMPUTER SYSTEM HAVING INDIVIDUAL COMPUTERS WITH DATA FILTERS

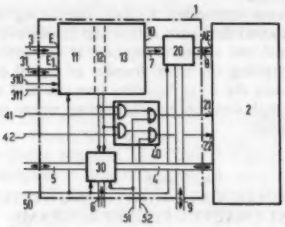
Rudolf Kober, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 19, 1978, Ser. No. 870,756

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703559

Int. Cl.[2] **G06F** *15/16, 13/00*

U.S. Cl. 364—200 **9 Claims**



1. A computer system comprising a system bus having a system address bus and a system data bus, a plurality of individual computers, a plurality of read-write memories, one for each individual computer, each of said read-write memories being coupled with its individual computer and with said system data bus, and a plurality of data filters, one for each of said read-write memories, each of said data filters being connected with its read-write memory and with said system address bus and responsive to addresses on said system address bus for selectively interconnecting said read-write memory with said system data bus, said system address bus supplying an access address to said data filter, said data filter comprising an associative memory for storing recognition words, each of said recognition words corresponding to a data storage location of said read-write memory, means for addressing said data storage locations, means for conveying the address of said data storage location to said read-write memory when an access address supplied to said associative memory from said system address bus corresponds to the corresponding recognition word, and means responsive to a recognition word for supplying a read-write command to said read-write memory.

4,183,087

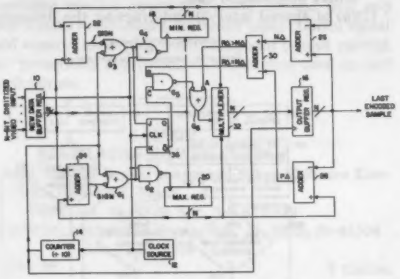
PEAK DEVIATION SAMPLING

Kenneth A. Huelsman, Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 7, 1978, Ser. No. 884,329

Int. Cl.[2] **G06F** *15/20;* **H03K** *5/20*

U.S. Cl. 364—515 **7 Claims**



1. A method for sampling a signal, to obtain samples that are most nearly representative of the signal amplitude during successive intervals, comprising the steps of taking a number of samples of the signal during each interval, and selecting for each interval, as representative of the entire interval, a sample from among those taken during the interval that has the maximum deviation from the sample selected from the immediately preceding sampling interval.

4,183,088

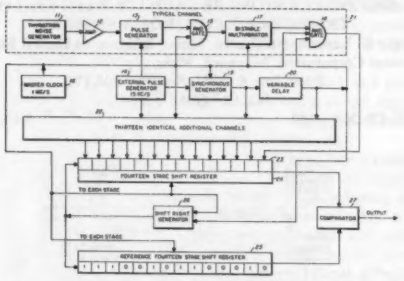
RANDOM NUMBER GENERATOR

Robert E. Simmons, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1962, Ser. No. 170,287

Int. Cl.[2] **H03B** *29/00*

U.S. Cl. 364—717 **13 Claims**



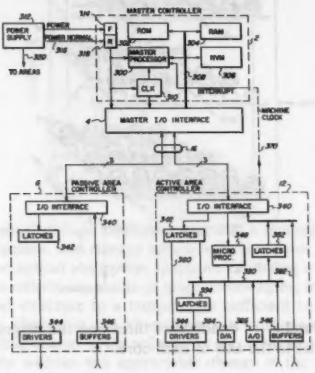
1. A generator for producing random binary bits comprising in combination, means for producing a random noise electrical signal, means coupled to the output of said signal producing means for converting said random noise electrical signal into a variable width square wave signal having polarities proportional to the polarities thereof at any given instant, means connected to the output of said converting means for producing a plurality of constant frequency pulses the number of which is proportional to the widths of those portions of the aforesaid variable width square wave signal having the same polarity, and means effectively connected to said pulse producing means for timely sampling said pulses in terms of binary bits.

4,183,089

DATA COMMUNICATIONS SYSTEM FOR A REPRODUCTION MACHINE HAVING A MASTER AND SECONDARY CONTROLLERS

John W. Daughton, Perinton, N.Y.; Kenneth Gillett, Redondo Beach, and Frank M. Nelson, Sherman Oaks, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,013
Int. Cl.[2] G06F *3/04, 9/06;* G03G *15/00*
U.S. Cl. 364—900 **6 Claims**



1. For use in a reproducing machine having a plurality of devices for controlling said machine, a data communications system comprising:

a. a programmable master controller including:

1. master program memory storage means for storing program words defining an operating program,
2. addressing means for addressing said program words of said master program memory storage means,
3. an arithmetic and logic unit for processing said program words of said master program memory storage means, and
4. means for generating command bytes, said generating means operatively connected to said arithmetic and logic unit of said master controller, and

b. a plurality of additional controllers, each of said additional controllers including:

1. means for receiving command bytes from said master controller generating means, and
2. means for providing input data bytes indicative of the operation of at least some of said devices to said master controller arithmetic and logic unit,

c. said additional controllers having selected input data bits ORed together to provide at least one of said input data bytes, and

d. said additional controllers simultaneously transmitting said selected input bits comprising said one input data byte to said master controller arithmetic and logic unit in response to a predetermined command byte from said master controller generating means.

4,183,090

MAGNETIC BUBBLE MEMORY EQUIPMENT

Kazuo Furukawa; Takeshi Masuda, both of Yokohama; Masakatu Nunotani, Tokyo, and Norio Amano, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Japan

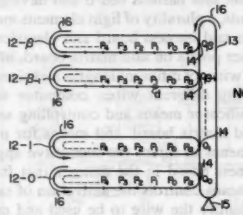
Filed Apr. 18, 1978, Ser. No. 897,392
Claims priority, application Japan, Apr. 20, 1977, 52-44444
Int. Cl.[2] G06C *13/00;* G11C *19/08*
U.S. Cl. 364—900 **8 Claims**

1. A magnetic bubble memory equipment adapted to receive address informations for a plurality of access requests each of which informations includes a chip address, a minor loop address and a major loop address and receive operation command informations commanding either read-out or write-in operations corresponding to said access requests from a data channel equipment and to execute sequentially data transfers with said data channel equipment, comprising:

(a) a bubble chip module including a plurality of magnetic bubble memory chips each of which is of a major-minor loop configuration having gates, gate driver circuits for driving said gates of said chip in response to gate drive signal, a gating signal connection circuit adapted to receive said chip address and said gate drive signal and apply the received gate drive signal to the gate driver circuit corresponding to the received chip address thereby to drive the associated gate, and chip selector circuit means for receiving said operation command informations, said chip address and data transfer command signal thereby to perform data read-out operation or data write-in operation for the chip corresponding to said received chip address;

(b) address information storage means for receiving a plurality of address informations for said plurality of access requests in one lot from said data channel equipment to store therein separately the chip addresses, minor loop addresses and the major loop addresses separately for each of said access requests;

(c) matching means including first signal generating means for generating signals indicating rotating positions of the minor loops of said magnetic bubble memory chips, second signal generating means for generating signals indicating rotating positions of the informations in the major



loops in each of said chips transferred from the minor loop in each of said chips corresponding to said plurality of access requests, first matching means for fetching sequentially the minor loop addresses for said plurality of access requests from said address information storage means to verify matching to said signals indicating the rotating positions of said minor loops thereby to output the gate drive signals upon verification of said matching, and second matching means for fetching sequentially the major loop addresses for said plurality of access requests from said address information storage means to verify matching to said signals indicating said rotating positions of informations in said major loops thereby to output said data transfer command signal upon verification of said matchings; and

(d) means for executing the data transfers between said magnetic bubble chip module and said data channel equipment, said executing means including operation command means for receiving the operation command informations and identifying the contents thereof in respect of data read-out or write-in commands thereby to cause said chip selector circuit means to perform the read-out or write-in operation in dependence on the contents of said operation command information, means for receiving the data transfer command signals from said matching means and sending the read-out data from said chip selector circuit means to said data channel equipment or sending the data to be written from said data channel equipment to said chip selector circuit means in accordance with said command

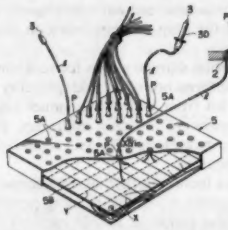
identified by said operation command means, and means for fetching the operation command information from said data channel equipment to be supplied to said operation command means and fetching the address informations to be supplied to said address information storage means.

4,183,091

WIRING DEVICE

Unosuke Murai, Tokyo, Japan, assignor to Taiko Denki Company Limited, Japan

Filed Mar. 15, 1978, Ser. No. 886,947
Claims priority, application Japan, Mar. 19, 1977, 52-30918
Int. Cl.[2] G11C *13/00*
U.S. Cl. 365—51 **8 Claims**



1. A wiring device comprising a harness board, a plurality of contact pieces mounted on said harness board, a matrix board separate from said harness board and having a multiplicity of contact points, a plurality of light elements mounted at selected positions on said harness board and electrically connected to select contact points on said matrix board, means for storing a plurality of wires of different lengths and sizes, indicator means for identifying different wires, computor means controlling said wire indicator means and controlling said light elements through said matrix board, and means for programming said computor means to direct the successive application of wires to said harness board in the manner that for each wire said computor means controls the activation of said wire indicator means to identify the wire to be used and controls said light elements to identify spaced contact pieces to which said wire is to be connected and to indicate the routing of said wire between said contact pieces.

4,183,092

CUBIC MAGNETIC CORE STORAGE MEMORY SYSTEM

Edward R. Sutich, St. Paul, Minn., assignor to Fabri-Tek Incorporated, Minneapolis, Minn.

Filed Jul. 31, 1978, Ser. No. 929,703
Int. Cl.[2] G11C *5/06*
U.S. Cl. 365—51 **5 Claims**

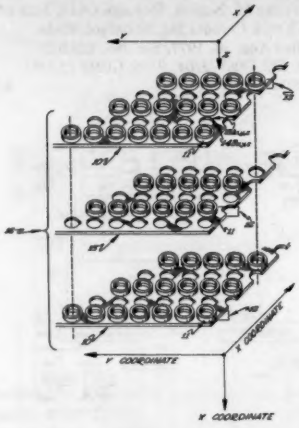
1. A magnetic core storage memory system comprising:

(a) an even carrier plane having aligned rows of first apertures with second apertures adjacent to the periphery of the first apertures and in communication therewith;

(b) an odd carrier plane having aligned rows of first apertures the axis of which are spaced apart a distance equal to the spacing between the axis of the first apertures of the even carrier plane with second apertures adjacent to the periphery of the first aperture and in communication therewith, said second aperture being disposed in a direction opposite to the direction of the second aperture of the even carrier plane, the odd carrier plane being placed relative to the even carrier plane so that the axis of the first apertures of the even carrier plane are coincident with the axis of the first apertures of the odd carrier plane;

(c) a plurality of magnetic cores mounted on every other row of first apertures of an even carrier plane and a plurality of magnetic cores mounted on rows of first apertures on the odd carrier plane which rows correspond with the rows of the first apertures on the even carrier plane which rows have no magnetic cores mounted thereon;

(d) a plurality of conductors threading the magnetic cores diagonal to the axis of each core; and



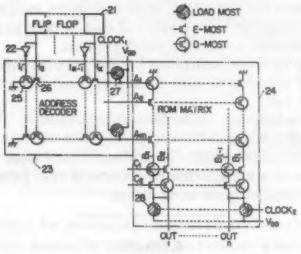
(e) a plurality of conductors threading the magnetic cores parallel to the axis of each core.

4,183,093

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE COMPOSED OF INSULATED GATE FIELD-EFFECT TRANSISTOR

Hiroto Kawagoe, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Division of Ser. No. 634,772, Nov. 24, 1975. This application Mar. 31, 1978, Ser. No. 892,202
Claims priority, application Japan, Sep. 4, 1975, 50-107350
Int. Cl.[2] G11C *17/00, 11/40;* H03K *19/08*
U.S. Cl. 365—104 **25 Claims**



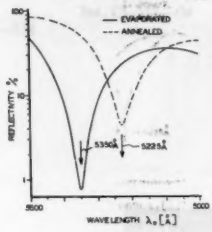
13. A semiconductor integrated circuit device comprising:

a plurality of field effect transistors connected between an output terminal and a reference terminal such that, when said transistors conduct in response to input signals applied to the gates thereof, the conduction paths between the source and drain thereof form a series current path between said output terminal and said reference terminal, and wherein at least one of said transistors is a depletion mode field effect transistor.

4,183,094
OPTICAL STORAGE MEDIUM USING THE FREQUENCY DOMAIN

Richard C. Keezer, Los Altos, and Ronald H. Geils, Palo Alto, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 20, 1978, Ser. No. 890,723
Int. Cl.[2] G11C *13/04*
U.S. Cl. 365—127 **11 Claims**

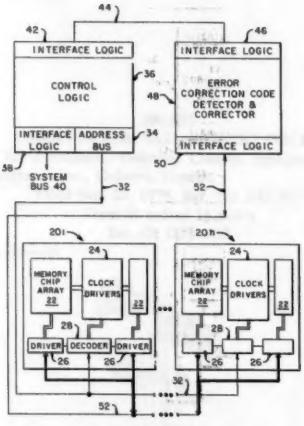


1. An optical storage medium comprising a layered optical storage structure, said storage structure having prior to heating, a given optical absorption spectrum exhibiting a maxima and minima reflectivity at one or more wavelengths, means for heating said structure to a temperature sufficient to cause a measurable change in the absorption spectrum providing a corresponding change in the reflectivity spectrum at said given wavelengths without any appreciable change in the index of refraction thereof.

4,183,095
HIGH DENSITY MEMORY DEVICE

William P. Ward, Poway, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 1, 1978, Ser. No. 939,297
Int. Cl.[2] G11C *13/00, 11/40*
U.S. Cl. 365—189 **9 Claims**

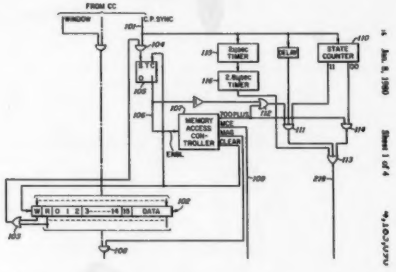


3. A READ/WRITE memory system comprising:
- a plurality of memory elements operatively connected in an addressable array;
- a plurality of said addressable arrays;
- decoder means for addressing selected ones of said addressable arrays;
- a plurality of enabling means each operatively associated with a corresponding memory element for detecting the state of a clock signal and for enabling an associated memory element when the clock signal is of a first state and for disabling said associated memory element when the clock signal is of a second state;
- clock means responsive to the addressing by said decoder means for applying a clock signal of a first state to said enabling means and for applying a clock signal of a second state in the absence of an addressing;
- a plurality of operating mode means each associated with a corresponding memory element for receiving a mode signal and for responding to said mode signal when said associated memory elements are enabled by placing said memory element in a READ mode in response to a mode signal of a first state and in a WRITE mode in response to a mode signal of a second state; and
- circuit means operatively connected to said operating mode means for controllably providing a mode signal of a first state to said plurality of memory elements to place enabled memory elements in a READ mode and for controllably providing a mode signal of a second state to place enabled memory elements in a WRITE mode.

4,183,096
SELF CHECKING DYNAMIC MEMORY SYSTEM

Ronald P. Cenker, Coplay, Pa.; Thomas W. Fleming, Naperville, and Frank R. Huff, Winfield, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 25, 1978, Ser. No. 909,367
Int. Cl.[2] G11C *13/00*
U.S. Cl. 365—222 **12 Claims**



1. A fault detection arrangement for a dynamic memory system comprising:
- dynamic storage means for storing a plurality of digital words wherein each of said digital words has a unique storage location within said storage means and each of said digital words comprises an information portion and an associated error check portion;
- refresh means for refreshing said dynamic storage means by repetitively performing refresh operations, a predetermined number of said digital words being refreshed during each refresh operation;
- reading means, operative during each refresh operation, for reading from said dynamic storage means one digital word of each of said predetermined number of digital words refreshed; and
- error checking means, responsive to said digital words read by said reading means, for determining if the information portion of each digital word read from said dynamic storage means by said reading means, properly corresponds to its associated error check portion and for generating a fault signal when such proper correspondence does not exist.

253,856

TENNIS SOCK

William E. Cline, and Rondal B. Mull, both of Drexel, N.C., assignors to Silver Knit Industries, Inc.

Filed Oct. 14, 1976, Ser. No. 732,462
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—334

253,857

CARRIER FOR SKIS AND SKI POLES

Charles G. Thompson, Oshawa, Canada, assignor to Caskel International Inc., Oshawa, Canada

Filed Sep. 25, 1978, Ser. No. 945,942
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D3—36

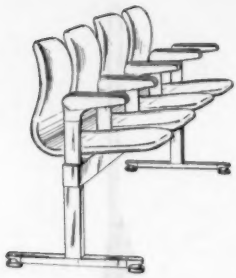
253,858

SHOULDER BAG

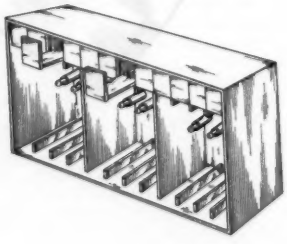
Terry Scheller, Newton Centre, Mass., assignor to The Bugatti Inc., Cambridge, Mass.

Filed Nov. 14, 1978, Ser. No. 960,562
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—48

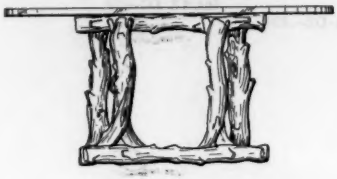
253,859
MULTIPLE SEATING UNIT
Isao Hosoe, Milan, Italy, assignor to Sacea S.a.s. di Tirinnanzi, Legnano, Italy
Filed Aug. 25, 1977, Ser. No. 827,827
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—59



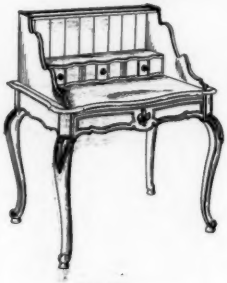
253,860
COMBINED VIDEO CASSETTE STORAGE AND EJECTION CABINET
Gary M. Schwartz, East Windsor, and Louis Simon, Branchburg, both of N.J., assignors to Le-Bo Products Company, Inc., Maspeth, N.Y.
Filed Jan. 3, 1978, Ser. No. 866,603
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130



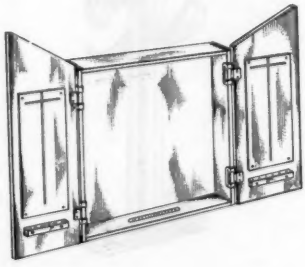
253,861
COCKTAIL TABLE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Dec. 12, 1977, Ser. No. 859,733
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—147



253,862
WRITING DESK OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Dec. 12, 1977, Ser. No. 859,933
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—153

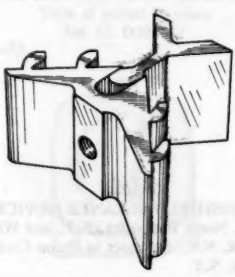


253,863
DARTBOARD CABINET OR SIMILAR ARTICLE
Ronald A. Kurtz, Engelwood, N.J., assignor to Kulite Tungsten Corporation, Ridgefield, N.J.
Filed Jan. 16, 1978, Ser. No. 869,920
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—167

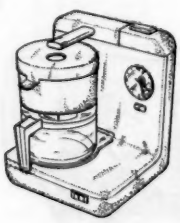


253,864
CORNER CAP FOR FURNITURE
Harold Glaser, St. Louis County, Mo., assignor to James David Incorporated, Maryland Heights, Mo.
Filed Sep. 23, 1977, Ser. No. 835,979
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

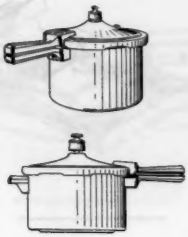
253,865
TENSIONING CONNECTOR ELEMENT FOR FURNITURE PIECES OR THE LIKE
Ruben Hägglund, 570 70 Högsby, Sweden
Filed Sep. 15, 1977, Ser. No. 833,614
Claims priority, application Sweden, Mar. 25, 1977, 770685
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



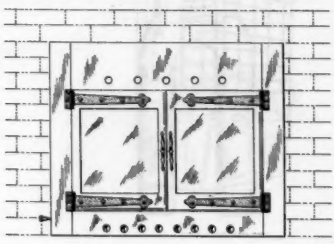
253,866
PERCOLATOR
Louis Bois, Dijon, France, assignor to S E B, Selongey, France
Filed Aug. 9, 1977, Ser. No. 823,183
Claims priority, application France, Mar. 15, 1977, 142
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—62



253,867
PRESSURE COOKER
Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston, and James P. Stevens, Oak Park, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Filed Oct. 3, 1977, Ser. No. 838,768
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—86

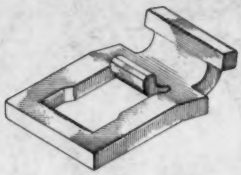


253,868
FIREPLACE SCREEN
Anthony Mancarella, Peters La., Rockfall, Conn. 06481
Filed Feb. 24, 1978, Ser. No. 881,156
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—208



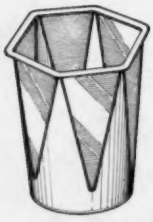
253,869
ADJUSTABLE FERTILIZER APPLICATOR FOR HOUSE PLANTS
Charles A. Wells, Marysville, Ohio, assignor to O.M. Scott & Sons Company, New York, N.Y.
Filed Sep. 14, 1977, Ser. No. 833,390
Term of patent 14 years
Int. Cl. D7—*99*; D10—*04*
U.S. Cl. D8—2

253,870
CHAIN LINK
Eugene W. Onulak, Huntington, Ind., assignor to Allied-Locke Industries, Dixon, Ill.
Filed Sep. 19, 1977, Ser. No. 834,373
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—499



253,871
BOTTLE
Philip F. Hartung, 655 Main St., East Greenwich, R.I. 02818
Filed Nov. 16, 1977, Ser. No. 852,172
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—117

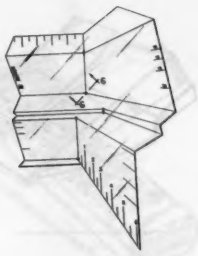
253,872
OPEN TOP PACKAGING CONTAINER
William G. Reynolds, Richmond, Va., assignor to Reynolds Metals Company
Filed Mar. 18, 1977, Ser. No. 779,261
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



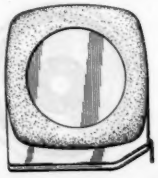
253,873
ENVELOPE AND WRITING PAPER DISPENSER
Ruthann Friedman, and Alana Coghlan, both of 731 Howard St., Marina Del Rey, Calif. 90291
Filed Apr. 18, 1977, Ser. No. 788,553
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224

253,874
WINDSHIELD CLEANER DEVICE
George Kaufman, North Brunswick, N.J., and Willsey W. DuBois, New York, N.Y., assignors to Union Carbide Corporation, New York, N.Y.
Filed Dec. 19, 1977, Ser. No. 862,210
Term of patent 14 years
Int. Cl. D9—*07*; D7—*05*
U.S. Cl. D9—253

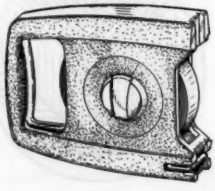
253,875
DRAWING INSTRUMENT
Joseph M. Boarman, 1814 W. Wyoming St., Indianapolis, Ind. 46221
Filed Jul. 15, 1977, Ser. No. 816,094
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—62



253,876
TAPE RULE
Laird F. Covey, Easton, Conn., assignor to The Stanley Works
Filed Jan. 19, 1978, Ser. No. 864,657
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—72

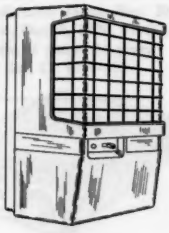


253,877
TAPE RULE
Laird F. Covey, Easton, and Richard H. Rathbun, New London, both of Conn., assignors to The Stanley Works
Filed Sep. 26, 1977, Ser. No. 836,916
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—72



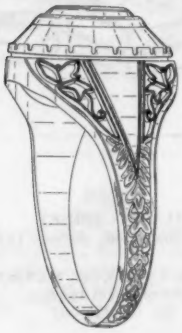
253,878
DIGITAL DISPLAY BALANCE
Bernard Wasko, 33 Central Dr., Bronxville, N.Y. 11212, and Manfred Hegemann, One S. Franklin St., Nyack, N.Y. 10960
Division of Ser. No. 543,623, Jan. 23, 1975. This application Feb. 2, 1977, Ser. No. 765,106
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91

253,879
ALARM CABINET
Eric A. Jensen, San Jose, Calif., assignor to Optical Coating Laboratory, Inc.
Filed Apr. 17, 1978, Ser. No. 896,911
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

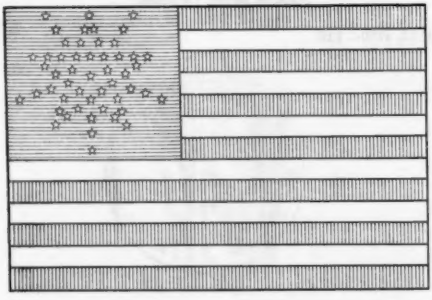


253,880
COMBINED FACE AND HANDS FOR A CLOCK OR SIMILAR ARTICLE
Roger E. Hutchinson, 111 N. 75th, Seattle, Wash. 98103
Filed Sep. 12, 1977, Ser. No. 832,432
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—124

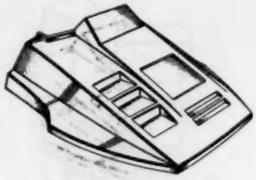
253,881
RING
Bill Corbin, Austin, Tex., assignor to Artcarved Class Rings, Inc., New York, N.Y.
Filed Dec. 20, 1977, Ser. No. 862,350
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—35



253,882
FLAG
John D. Blood, 1701 Queenswood Dr., Findlay, Ohio 45840
Filed Mar. 28, 1977, Ser. No. 781,796
Term of patent years
Int. Cl. D11—*05*
U.S. Cl. D11—180



253,883
SNOWMOBILE HOOD
Yoshiharu A. Shimasaki, La Mesa, Calif., assignor to Kawasaki Motors Corp. U.S.A., Santa Ana, Calif.
Filed Nov. 7, 1977, Ser. No. 849,481
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—7



253,884
WHEEL
Giorgetto Giugiaro, Via A. Grandi, No. 11, 10024 Moncalieri (Torino), Italy
Filed Nov. 7, 1977, Ser. No. 849,433
Claims priority, application Fed. Rep. of Germany, May 6, 1977, 10973
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

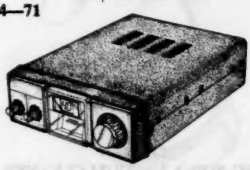
253,885
SOLAR CELL
Desmond P. Spittlehouse, Ewan, N.J., assignor to McGraw-Edison Company, Elgin, Ill.
Filed Oct. 20, 1977, Ser. No. 843,805
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—4

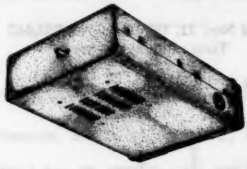
253,886
CONTROL UNIT FOR RADIO EQUIPMENT
Jan E. Örn, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Aug. 5, 1977, Ser. No. 821,983
Claims priority, application Sweden, Mar. 8, 1977, 7700054
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12

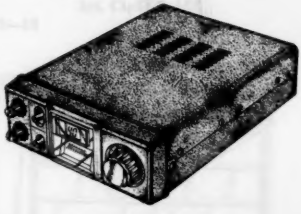
253,887
PANEL FOR AN ELECTRONIC MODULE
James F. Turner, 11523 Vale Rd., Oakton, Va. 22174, and Gary A. Dixon, 3200 Arden St., Dunn Loring, Va. 22027
Filed Jun. 28, 1977, Ser. No. 811,457
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35

253,888
TUNER
John J. Bocko, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.
Filed Jul. 7, 1977, Ser. No. 813,745
Claims priority, application Benelux, Jan. 12, 1977, 5159303
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—71

253,889
CITIZENS BAND TRANSCEIVER
Shuhei Taguchi, Hirakata, and Tsutomu Murakami, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadma, Japan
Filed Mar. 17, 1977, Ser. No. 778,697
Claims priority, application Japan, Sep. 20, 1976, 51-37493; Sep. 20, 1976, 51-37494; Dec. 9, 1976, 51-48130
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—71





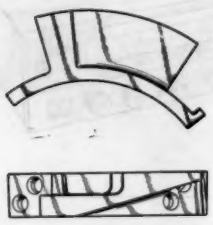


253,890

CUTTING TOOTH SUPPORT BRACKET FOR A ROAD PLANING MACHINE

George W. Swisher, Jr., 1500 Dorchester Dr., Oklahoma City, Okla. 73120, and Thomas L. Steele, 2536 NW. 30th, Oklahoma City, Okla. 73112

Filed Feb. 15, 1978, Ser. No. 878,170
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—28

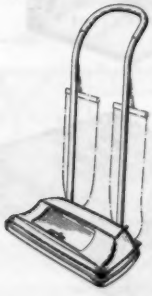


253,891

CASING FOR A VACUUM CLEANER

Harold W. Schaefer, Bloomington, Ill., and Martin E. Wiese, South Bend, Ind., assignors to National Union Electric Corporation

Filed Nov. 21, 1977, Ser. No. 853,442
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—53



253,892

RIVET SETTER

Donald R. Humphreys, Marblehead, Mass., assignor to Custom Radius Corporation, Topsfield, Mass.

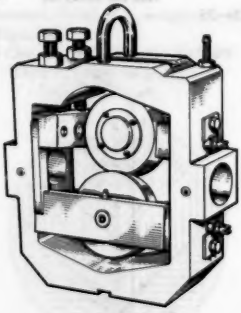
Filed Feb. 27, 1978, Ser. No. 881,837
Term of patent 7 years
Int. Cl. D15—*09*
U.S. Cl. D15—128

253,893

TWIST GUIDE FOR METALWORKING IN A ROLLING MILL

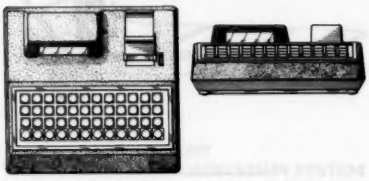
Kurt L. Danielsson, Smedjebacken, Sweden, assignor to Morgardshammar Aktiebolag, Smedjebacken, Sweden

Filed May 19, 1977, Ser. No. 798,683
Claims priority, application Sweden, Mar. 29, 1977, 770704
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—138



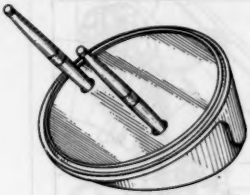
253,894
PORTABLE HEAT SEALER
Anthony J. Lombardi, Flanders, N.J., assignor to Barney Knitting Machinery Co., Inc., Brooklyn, N.Y.
Filed May 24, 1977, Ser. No. 800,101
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—146

253,895
BUSINESS RECORD APPARATUS
Frank R. Anderson, Hacienda Heights, Calif., assignor to Westates Space-Era Products, Inc., S. El Monte, Calif.
Filed Nov. 7, 1977, Ser. No. 849,167
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



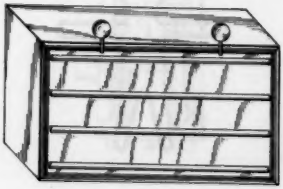
253,896
PAINTING AND LETTERING GUIDE FOR AN ARTIST OR THE LIKE
Jack Hall, 2306 Manning Ave., Los Angeles, Calif. 90064
Filed Dec. 15, 1977, Ser. No. 857,561
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—37

253,897
DESK SET
Raymond E. Cross, Lake Forest, Ill., assignor to Federal Research Corporation
Filed Jul. 3, 1978, Ser. No. 921,354
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—75

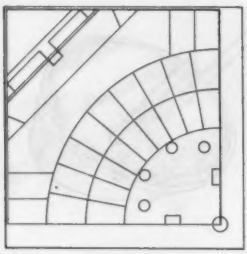


253,898
COMBINED DESK SET AND LAMP
Raymond E. Cross, Lake Forest, Ill., assignor to Federal Research Corporation
Filed Jul. 3, 1978, Ser. No. 921,356
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—77

253,899
SIGN WITH CHANNELS FOR MOVEABLE CHARACTER PLATES
Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211
Filed Aug. 25, 1977, Ser. No. 827,814
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10



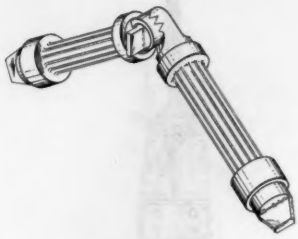
253,900
BASEBALL GAME BOARD
Sulo Arvonen, 71 Laurentian Dr., Sault Ste. Marie, Ontario, Canada
Filed Apr. 12, 1978, Ser. No. 895,777
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—28



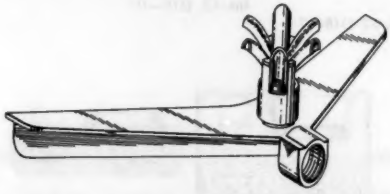
253,901
TOY MOTOR SCOOTER OR SIMILAR ARTICLE
Paul W. Sansom, Manhattan Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Oct. 11, 1977, Ser. No. 841,157
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—81

253,902
PUZZLE
John S. Schoentag, 1869 Walnutway, St. Louis, Mo. 63141
Filed Jul. 5, 1977, Ser. No. 813,102
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—106

253,903
ARM AND WRIST EXERCISING DEVICE
Stan Gibson, Richmond, Canada, assignor to Graphic Holdings, Ltd., Surrey, Canada
Filed Dec. 9, 1977, Ser. No. 858,950
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—198



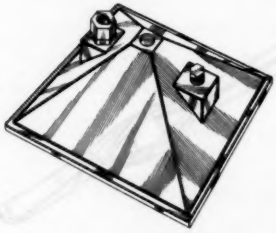
253,904
LAWN SPRINKLER
Jack F. Clearman, 2525 Langley Ave., St. Joseph, Mich. 49085
Filed Feb. 15, 1978, Ser. No. 877,910
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7



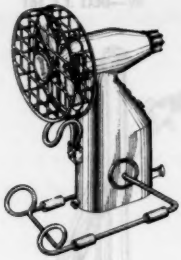
253,905
FAUCET VALVE
John H. Pimm, East Grand Rapids, Mich., assignor to Michigan Brass Company, Grand Haven, Mich.
Filed Dec. 15, 1977, Ser. No. 860,851
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

253,906
FAUCET
Luigi Colani, Sassenberg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.
Filed Jun. 30, 1978, Ser. No. 920,852
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1978, MR 6769
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25

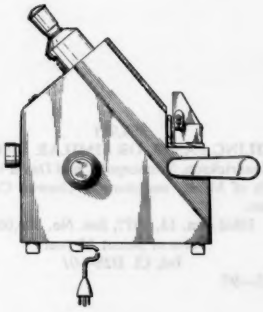
253,907
VAPORIZER FOR A COMBUSTION SYSTEM
Fred A. Wentworth, Jr., Brentwood Rd., R.F.D. #2, Exeter, N.H. 03833, and Paul F. Heald, 91 Alehson Rd., Rye, N.H. 03870
Filed Jul. 21, 1977, Ser. No. 817,836
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—146

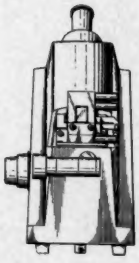


253,908
PORTABLE FAN
David A. Holder, Jr., 8303 Donoghue Dr., New Carrollton, Md. 20784
Filed Oct. 19, 1977, Ser. No. 843,533
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—155



253,909
REFRACTOMETER
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jul. 8, 1977, Ser. No. 813,909
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—17





253,910

BUTTRESS ASSEMBLY OF AN OVAL SWIMMING POOL

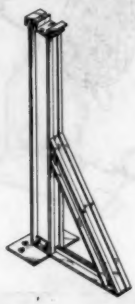
Herbert O. Kaufmann, Kew Gardens, N.Y., assignor to Swim 'n Play, Inc., Newark, N.J.

Filed Oct. 20, 1977, Ser. No. 843,894

Term of patent 14 years

Int. Cl. D25—*99*

U.S. Cl. D25—61



253,911

CEILING PANEL OR SIMILAR ARTICLE

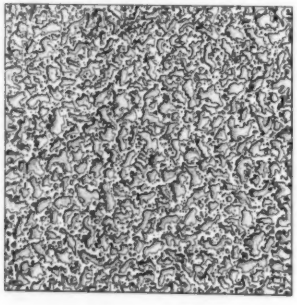
Miner H. Hendrickson, Minneapolis, and David W. Akerson, St. Paul, both of Minn., assignors to Conwed Corporation, St. Paul, Minn.

Filed Jun. 13, 1977, Ser. No. 806,084

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D25—97



253,912

GRILLE

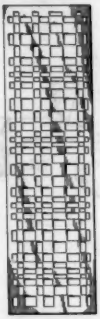
Robert T. Bogan, P.O. Box 26208, Albuquerque, N. Mex. 87125

Filed Oct. 27, 1977, Ser. No. 846,273

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D25—91



253,913

SMOKING PIPE TOOL

James E. Sullivan, 1663 S. Quitman, Denver, Colo. 80219

Filed Dec. 12, 1977, Ser. No. 859,982

Term of patent 14 years

Int. Cl. D27—*99*

U.S. Cl. D27—51

253,914

HAIRDRYER WITH HANDGRIP

Heinz-Ulrich Haase, Kronberg, Fed. Rep. of Germany, assignor to Braun A G, Frankfurt am Main, Fed. Rep. of Germany

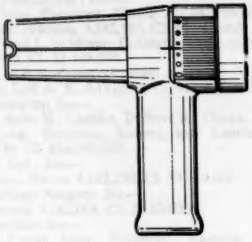
Filed Oct. 3, 1977, Ser. No. 839,114

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 73 MR 8600

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D28—13



253,915

SCOOP-LIKE DEVICE FOR PICKING UP AND REMOVING ANIMAL DROPPINGS AND THE LIKE

Michael P. Hennessy, 1924 W. Wilson Ave., Chicago, Ill. 60640; Andrew B. Prueher, 1016 Sheridan Rd., Highland Park, Ill. 60035, and Paul E. Wagner, 2471 N. Clybourn Ave., Chicago, Ill. 60614

Filed Oct. 20, 1977, Ser. No. 843,853

Term of patent 14 years

Int. Cl. D30—*99*

U.S. Cl. D30—99

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TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF JANUARY, 1980

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A B Servator: *See*—
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A. H. Robins Company, Incorporated: *See*—
Welstead, William J., Jr.; and Moran, Henry W., 4,182,774, Cl. 424-309.000.

A. T. Ramot Plastics Ltd.: *See*—
Youval, Anat; Frommer, Moshe A.; Movshovich, Shmuel; and Cojocaro, Adriana, 4,182,582, Cl. 405-45.000.

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Sakurazawa, Hatuo, 4,182,230, Cl. 99-349.000.

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Pouget, Rene, 4,182,008, Cl. 24-230.00A.

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Nishida, Fusao; Ueno, Toshihiro; Yamada, Tomiaki; Suzuki, Noriyuki; Takeda, Takehiko; Yanagihara, Tsutomu; Adachi, Katsuhiko; Asanabe, Tadashi; Ohsato, Katsuaki; Tsuda, Kintaro; and Watanabe, Keiichiro, 4,182,745, Cl. 423-239.00A.

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Bardy, Michel, 4,182,169, Cl. 73-160.000.

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Laar, Erwin; Wagner, Karl-Heinz; and Krauss, Siegfried, 4,182,567, Cl. 354-299.000.
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Agrawala, Ashok K.; Kulkarni, Ashok V.; and Paul, Edwin H., Jr., to Coulter Electronics, Inc. System for extracting shape features from an image. 4,183,013, Cl. 340-146.3AC.

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Iwashita, Tomonori; Uchidoi, Masanori; Ichiyanagi, Toshikazu; Taguchi, Tetsuya; Iura, Yukio; and Aizawa, Hiroshi, 4,182,562, Cl. 354-173.000.

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Aoyagi, Yoshiaki: *See*—
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Bakalyar, Stephen R.; and Sylvester, Reginald E., to Rheodyne Incorporated. Sample injector. 4,182,184, Cl. 73-422.0GC.

Baker, Bernard S.; and Dharia, Dilip J., to Energy Research Corporation. Fuel cell thermal control and reforming of process gas hydrocarbons. 4,182,795, Cl. 429-13.000.

Baker CAC, Inc.: *See*—
Akkerman, Neil H., 4,182,369, Cl. 137-596.180.

Baker, Don R.; and Walker, Frank H., to Stauffer Chemical Company. 3-Halo-5-(lower alkoxy) phenoxy alkyl amides. 4,182,625, Cl. 71-105.000.

Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., to NPI Corporation. Frozen patty feeder. 4,182,231, Cl. 99-387.000.

Baker, Gary L. Turret type metal working machine. 4,182,205, Cl. 82-3.000.

Balcke-Durr Aktiengesellschaft: *See*—
Adrian, Fritz, 4,182,402, Cl. 165-10.000.

Baldi, Luciano; Giorcelli, Giuliano; and Francese, Renato, to Rumianca S.p.A. Process for the production of chloro-bis(alkylamino)-s-triazines. 4,182,874, Cl. 544-204.000.

Ball, Duane L. Interior mounted window barriers and channel members therefor. 4,182,088, Cl. 52-202.000.

Ball, George L., III: *See*—
Salyer, Ival O.; Botham, Ruth A.; and Ball, George L., III, 4,182,398, Cl. 165-1.000.

Ballestrazzi, Aris; Tassi, Lamberto; and Tosarelli, Gianni, to Sitma S.p.A. Societa Italiana Macchine Automatiche. Machine for wrapping light objects, for example paper cups, in flexible plastics wrappers. 4,182,096, Cl. 53-553.000.

Balzer, Abram P. Tractor unit for implements and vehicles. 4,182,426, Cl. 180-12.000.

Balzer, Hans: *See*—
Fleck, Fritz; Balzer, Hans; and Aebli, Horst, 4,182,861, Cl. 542-441.000.

Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten: *See*—
Bracher, Bernhard, 4,182,265, Cl. 118-500.000.

Ban, Ivan: *See*—
Asai, Akiji; Ban, Ivan; David, Samuel; and Thies, Peter W., 4,182,889, Cl. 546-197.000.

Barclay, Robert, Jr.: *See*—
Schmidle, Claude J.; and Barclay, Robert, Jr., 4,182,848, Cl. 528-376.000.

Bardy, Michel, to Institut Textile de France; and Agence Nationale de Valorisation de la Recherche. Tension detector for an advancing yarn layer. 4,182,169, Cl. 73-160.000.

Bare, John P.: *See*—
Angstadt, Howard P.; and Bare, John P., 4,182,909, Cl. 568-574.000.

Barnette, William E.; and Spong, Fred W., to RCA Corporation. Capacitance distance sensor apparatus for video disc player/recorder. 4,183,060, Cl. 358-128.000.

Bartholomew, Donald D., to Merit Plastics, Inc. Window regulator and drive assembly. 4,182,078, Cl. 49-139.000.

Bartlett, Philip L., to Du Pont de Nemours, E. I., and Company. Liquid-water displacement composition. 4,182,687, Cl. 252-194.000.

Bartmann, Wilhelm; Lerch, Ulrich; Teufel, Hermann; Scholkens, Bernward; and Beck, Gerhard, to Hoechst Aktiengesellschaft. Novel prostaglandin derivatives. 4,182,773, Cl. 424-305.000.

Barton, Jr., William M., to Cipher Data Products, Incorporated. Magnetic tape transport mechanism. 4,183,068, Cl. 360-90.000.

BASF Aktiengesellschaft: *See*—
Schulz, Bernhard; Grafen, Paul; Scholz, Hans-Ulrich; Grassner, Hans; and Reif, Werner, 4,182,731, Cl. 260-606.50F.
Straub, Ferdinand; Spoor, Herbert; Schenck, Hans-Uwe; and Schwarz, Wolfgang, 4,182,851, Cl. 528-491.000.

BASF Wyandotte Corporation: *See*—
Argade, Shyam D.; and Coker, Thomas G., 4,182,670, Cl. 204-252.000.
Otrhalek, Joseph V.; Ajluni, Raymond M.; and Gomes, Gilbert S., 4,182,637, Cl. 148-6.14R.

Baskeyfield, Lewis J.; Bell, John D.; Townend, John; and Pollock, Simon D. A., to Fisons Limited. Method for the production of 6-hydroxy-1,2,3,4-tetrahydronaphthalene. 4,182,916, Cl. 568-734.000.

Batik, Franz, to Wiener Bruckenbau-und Eisenkonstruktions-Aktiengesellschaft. Apparatus for transporting bulk materials. 4,182,445, Cl. 198-703.000.

Batz, Hans-Georg: *See*—
Horn, Jurgen; Albert, Winfried; Batz, Hans-Georg; and Nelbock-Hochstetter, Michael, 4,182,695, Cl. 260-6.000.

Baudard, Thierry; Schumperli, Max; and Pouzet, Alain, to Electronique Marcel Dassault. Transponder for radiocommunication system, particularly for measuring the distance between two stations. 4,183,022, Cl. 343-6.80R.

Bauer, Johann; Birke, Hans; Fendel, Kurt; and Sulek, Harald, to Wacker- Chemie GmbH. Process for the manufacture of vinyl chloride copolymers of a small and regular particle size. 4,182,819, Cl. 526-202.000.

Bauer, Klaus, to Jos. Schneider & Co. Light-ray deviator for camera objective. 4,182,565, Cl. 354-224.000.

Bayer Aktiengesellschaft: *See*—
Arlt, Dieter, 4,182,733, Cl. 260-982.000.
Goebel, Hermann; and Kramer, Erich, 4,182,713, Cl. 548-259.000.
Ludke, Heimo, 4,182,826, Cl. 528-57.000.
Mues, Volker; Behrenz, Wolfgang; Ditgens, Klaus; and Schmidt, Thomas, 4,182,771, Cl. 424-282.000.
Preiss, Michael, 4,182,762, Cl. 424-250.000.
Reischl, Artur; and Wenzel, Wolfgang, 4,182,828, Cl. 528-69.000.
Schmidt, Manfred; Freitag, Dieter; Fries, Hermann; and Esch, Erich, 4,182,697, Cl. 260-19.00R.
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,182,917, Cl. 568-771.000.
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,182,918, Cl. 568-771.000.
Walkowiak, Michael; Schulz, Hans-Hermann; and Rosenkranz, Hans J., 4,182,829, Cl. 528-75.000.
Zecher, Wilfried; and Merten, Rudolf, 4,182,812, Cl. 528-73.000.

Bayless, Allan V.; and Millner, Ozra E., Jr., to Morton-Norwich Products, Inc. N-[Diaminophosphinyl]arylcarboxamides. 4,182,881, Cl. 546-22.000.

Bazin, Lucas J.: *See*—
Herrmann, Donald C.; and Bazin, Lucas J., 4,183,045, Cl. 358-22.000.

Bechtold, Edmund C., Jr. Endodontic file holder and gauge. 4,182,040, Cl. 433-77.000.

Beck, Gerhard: *See*—
Bartmann, Wilhelm; Lerch, Ulrich; Teufel, Hermann; Scholkens, Bernward; and Beck, Gerhard, 4,182,773, Cl. 424-305.000.

Beckman Instruments, Inc.: *See*—
Frankland, Roger A.; and Franklin, Henry E., 4,182,540, Cl. 316-19.000.
Haunold, Otto; and Greene, Malbone W., 4,182,129, Cl. 62-3.000.

Beecham Group Limited: *See*—
Nunn, Barbara; and Baggaley, Keith H., 4,182,768, Cl. 424-267.000.
Taylor, Andrew W.; Burton, George; and Clayton, John P., 4,182,710, Cl. 260-245.200.

Beeskow, Bruno: *See*—
Hornig, Rudolf; Beeskow, Bruno; and Worner, Gunter, 4,182,139, Cl. 64-12.000.

Behpour, Ahmad; Kayser, Detlev; and Martin, Gerhard, to Merck Patent Gesellschaft mit beschraenkter Haftung. Alcohol deterrent. 4,182,770, Cl. 424-273.00R.

Behrenz, Wolfgang: *See*—
Mues, Volker; Behrenz, Wolfgang; Ditgens, Klaus; and Schmidt, Thomas, 4,182,771, Cl. 424-282.000.

Beige, Gunter; and Braunberger, Horst. Method and brace for treating epicondylitis. 4,182,318, Cl. 128-77.000.

Beirne, Patrick R.; Cowpland, Michael C. J.; and Whitbread, Raymond J., to Mitel Corporation. Transformerless trunk circuit. 4,182,936, Cl. 179-18.0AH.

Bekey, Ivan; and Wolk, Roger S. Mold for casting articulated castings from registered dental impressions. 4,182,507, Cl. 249-54.000.

Bell and Howell Company: *See*—
Muller, Wolfgang W.; Dobberstein, Hans H.; and Schroder, Erwin, 4,182,482, Cl. 235-454.000.

Bell, John D.: *See*—
Baskeyfield, Lewis J.; Bell, John D.; Townend, John; and Pollock, Simon D. A., 4,182,916, Cl. 568-734.000.

Bell, Roscoe L.: *See*—
Anderson, George J.; and Bell, Roscoe L., 4,182,014, Cl. 29-173.000.

Bell Telephone Laboratories, Incorporated: *See*—
Cenker, Ronald P.; Fleming, Thomas W.; and Huff, Frank R., 4,183,096, Cl. 365-222.000.
Keys, Charles T.; and Ratti, Renald A., 4,182,934, Cl. 179-7.00R.
Walsh, Edward G., 4,182,999, Cl. 335-151.000.

Bellhouse, Brian J., to National Research Development Corporation. Mass transfer between fluids and apparatus therefor. 4,182,653, Cl. 435-2.000.

Bemis Company, Inc.: *See*—
Lieder, Gaylerd M.; and Ayres, Richard H., 4,182,094, Cl. 53-67.000.

Bendix Corporation, The: *See*—
Ewald, Jerome T., 4,182,427, Cl. 180-148.000.
Fannin, Richard C., 4,182,535, Cl. 303-9.000.
Fulmer, Keith H., 4,182,220, Cl. 91-217.000.
Kluger, Michael A.; and Colpaert, James J., 4,182,439, Cl. 188-335.000.
Pauwels, Edward M., 4,182,536, Cl. 303-115.000.
Presley, Rex W., 4,182,221, Cl. 91-378.000.
Woodruff, Frank, 4,182,365, Cl. 137-494.000.

Benezech, Jacques, to Novi-P.B. Method of assembling a magneto rotor assembly. 4,182,027, Cl. 29-598.000.

Bennett, Herman W. Sling device for a rifle or the like. 4,182,469, Cl. 224-150.000.

Bennett, Richard N.: *See*—
Buckley, Lawrence W.; and Bennett, Richard N., 4,182,387, Cl. 141-129.000.

Bennett, Robert A. Manually operated pump using hollow flexible member as pumping chamber. 4,182,465, Cl. 222-207.000.

Benson, Gerald B., to G. D. Searle & Co., Limited. Pressure control tracheal device. 4,182,344, Cl. 128-351.000.

Benton, William J.; and Quigley, Joseph R. Elastomeric polyurethane film containing dispersed discrete aggregates of liquid crystal and method of making the same. 4,182,700, Cl. 260-37.00N.

Beran, Milos; Krepelka, Jiri; Semonsky, Miroslav; Rezabek, Karel; Seda, Miroslav; and Auskova, Marie, to Spofa, United Pharmaceutical Works. D-6-allyl-8-ergol-I-ylacetamide. 4,182,883, Cl. 546-67.000.

Berford, Saint E. B.: *See*—
Gay, Derek J.; Wilson, Nicol S.; Sweet, Roger H.; and Berford, Saint E. B., 4,182,076, Cl. 46-265.000.

Berger, Michael, to Linde Aktiengesellschaft. Breeding of aquatic animals in a controlled environment. 4,182,268, Cl. 119-3.000.

Bergstedt, Donald C., to U.S. ParaPlate Corporation. Method and apparatus for flow diversion in a high pressure fluid delivery system. 4,182,354, Cl. 137-10.000.

Berk, Gunter H.: *See*—
Irvine, John K.; Mitchell, Michael D.; and Berk, Gunter H., 4,182,683, Cl. 252-99.000.

Berkbigler, Roger L.: *See*—
McCormick, Harold E.; and Berkbigler, Roger L., 4,182,579, Cl. 403-326.000.

Berkhof, Hendrikus, to Honeywell Inc. Pressure regulator. 4,182,488, Cl. 236-92.00A.

Bernelin, Daniel: *See*—
Meyer, Jacques; and Bernelin, Daniel, 4,182,840, Cl. 525-437.000.

Bernemann, Paul; Kentschke, Rudolf; and Wieland, Dieter, to Chemische Werke Huels, A.G. Process for the production of polybutadiene having a high cis-1,4-content. 4,182,814, Cl. 526-92.000.

Bernhard, Frank L., to E-Systems, Inc. Balanced snubber apparatus. 4,182,504, Cl. 248-49.000.

Beveridge, Paul J.; and Vigesaa, Myron L., to Fiat-Allis Construction Machinery, Inc. Radiator top tank with plural sump lines. 4,182,404, Cl. 165-41.000.

Beyl, Jean A. J., to Look S.A. Safety ski binding. 4,182,524, Cl. 280-618.000.

Bianchi, Valerio: *See*—
Zeller, Hans; Latsch, Reinhard; Brettschneider, Johannes; and Bianchi, Valerio, 4,182,295, Cl. 123-119.0EC.

Biber, Conrad H.; Shenk, Edwin K.; and Tam, Shirley Y., to Polaroid Corporation. Focus control system for interchangeable adjustable focus lenses. 4,182,563, Cl. 354-197.000.

Biber, Conrad H.: *See*—
Land, Edwin H.; and Biber, Conrad H., 4,182,561, Cl. 354-145.000.

Bickel, Gary W.: *See*—
Maklad, Mokhtar S.; Sigel, George H., Jr.; and Bickel, Gary W., 4,182,664, Cl. 204-157.10H.

Bieringer, Hermann: *See*—
Soder, Alfons; Bieringer, Hermann; Burstell, Helmut; Langeludeke, Peter; and Sachse, Burkhard, 4,182,624, Cl. 71-92.000.

Bigall, Klaus D.; Muehlbauer, Otto; and Roesler, Helmut, to Siemens Aktiengesellschaft. Information transmission system. 4,182,211, Cl. 84-1.010.

Biomedical International Company: *See*—
Allison, Kenneth C., 4,182,346, Cl. 128-641.000.

Birke, Hans: *See*—
Bauer, Johann; Birke, Hans; Fendel, Kurt; and Sulek, Harald, 4,182,819, Cl. 526-202.000.

Birotronics Ltd.: *See—*
Wakeman, Richard C., 4,182,214, Cl. 84-1.280.
Bito, Minoru: *See—*
Ono, Hironobu; and Bito, Minoru, 4,182,300, Cl. 123-198.00D.
Bizev, Anatoly A.: *See—*
Sinelnikov, Alexandr V.; Patushinskaya, Raisa S.; Freidgeim, Lazar I.; Bizev, Anatoly A.; Druzhkova, Larisa M.; Salimov, Vyacheslav K.; Lebedich, Sergei P.; Lvov, Sergei L.; Minkina, Margarita E.; Shurygin, Alexandr P.; Levin, Valery S.; Faradzh-Zade, Solmaz A.; Lebedev, Igor V., deceased; and Lebedeva, Marina I., administrator, 4,182,358, Cl. 137-115.000.
Bjelkhagen, Hans: *See—*
Nilsson, Kenth; Hoek, Bertil; Ohlsson, Thomas; and Bjelkhagen, Hans, 4,182,316, Cl. 128-665.000.
Black, Charles A. Sanitary napkin with attached disposal container. 4,182,336, Cl. 128-290.00R.
Blackmer, David E., to DBX Inc. Detection and monitoring device. 4,182,930, Cl. 179-1.00R.
Blake, Sidney H. Repositioning a bed patient. 4,181,992, Cl. 5-443.000.
Blakeslee, Thomas R., to Logisticon, Inc. Fork lift hydraulic servo control valve. 4,182,126, Cl. 60-459.000.
Block, Albert, to Danfoss A/S. Method of making a piston with a gudgeon pin. 4,182,012, Cl. 29-156.50A.
Block, Charles; and Mintz, Leon. High speed indexing system. 4,182,251, Cl. 112-322.000.
Bloom Engineering Company, Inc.: *See—*
Hovis, James E.; Finke, Harry P.; and Leumann, Hans E., 4,182,609, Cl. 432-234.000.
Bocard, Christian; Renault, Philippe; Seris, Henri; and Gatellier, Claude, to Institut Francais du Petrole. Modified rubber, its use as hydrocarbon absorber. 4,182,677, Cl. 210-36.000.
Bocharov, Jury N.; Kabanov, Viktor A.; Martynova, Marina A.; Popov, Valery G.; Smetanjuk, Vladimir I.; and Fedorov, Viktor V. Polymeric gel catalyst for polymerization of α-olefines, conjugated and non-conjugated dienes. 4,182,811, Cl. 526-69.000.
Bodde, Egbert J. Light indicator for fishing tip-ups. 4,183,076, Cl. 362-120.000.
Boehringer Ingelheim GmbH: *See—*
Funk, Gerhard; Weller, Eberhard; Renovanz, Hans-Dietrich; and Papendick, Uwe, 4,182,183, Cl. 73-362.0AR.
Hartmeier, Winfried, 4,182,655, Cl. 195-63.000.
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; and Haarmann, Walter, 4,182,887, Cl. 546-119.000.
Boehringer, John R. Spirometer. 4,182,175, Cl. 73-229.000.
Boehringer, John R. Positive end expiratory pressure device. 4,182,366, Cl. 137-510.000.
Boehringer Mannheim GmbH: *See—*
Horn, Jurgen; Albert, Winfried; Batz, Hans-Georg; and Nelbock-Hochstetter, Michael, 4,182,695, Cl. 260-6.000.
Boeing Company, The: *See—*
Scott, John H.; and Harang, Arlyn O., 4,182,256, Cl. 114-282.000.
Boekhorst, Antonius, to U.S. Philips Corporation. Circuit for generating a sawtooth line deflection current. 4,182,978, Cl. 315-371.000.
Boik, Arnold R.: *See—*
Holk, Albert J., Jr.; and Boik, Arnold R., 4,182,460, Cl. 220-271.000.
Bolduc, Lee R.; and Dickhudt, Eugene A., to Population Research Incorporated. Dispensing instrument and method. 4,182,328, Cl. 128-235.000.
Boliden Aktiebolag: *See—*
Lagerstrom, Gosta B.; and Nilsson, Nils-Inge, 4,182,780, Cl. 426-636.000.
Bonadio, George A. H. Oral ingestion of indium. 4,182,754, Cl. 424-131.000.
Bordes, Kees, to N.V. Industrieele Handelscombinatie Holland. Drilling vessel with handling means for drilling pipe. 4,182,253, Cl. 114-72.000.
Borg-Warner Corporation: *See—*
Curfman, Don C.; and Rea, Gary D., 4,182,820, Cl. 526-212.000.
Erth, Richard A., 4,182,137, Cl. 62-505.000.
Borgardt, Valentina J.; Volodin, Jury I.; Shalimova, Zoya S.; Pantukh, Boris T.; Egoricheva, Sofya A.; Rutman, Grigory I.; and Michurov, Jury I. Method of purifying alkylphenol. 4,182,921, Cl. 568-750.000.
Borgmeier, Donald E.; and Higgs, Edward W., to United States of America, Navy. Graphite or carbon fiber composite structure, low temperature cure. 4,182,495, Cl. 239-265.110.
Boros, Lawrence A. Deep fill welding joint configuration and welding method. 4,182,950, Cl. 219-137.00R.
Bortuzzo, Jean-Pierre: *See—*
Roullet, Gerald; Bortuzzo, Jean-Pierre; and Chevalier, Serge, 4,183,069, Cl. 360-102.000.
Bosch, Manfred; and Marquardt, Richard, to W. Ferd. Klingelnberg Sohne. Device for checking involutes and helix angles of gears. 4,182,045, Cl. 33-179.50D.
Bostock, Stephen B.: *See—*
Renfrew, Andrew H. M.; and Bostock, Stephen B., 4,182,720, Cl. 260-343.30R.
Botham, Ruth A.: *See—*
Salyer, Ival O.; Botham, Ruth A.; and Ball, George L., III, 4,182,398, Cl. 165-1.000.
Bott, John A. Article carrier for automotive vehicles. 4,182,471, Cl. 224-326.000.
Boudreault, Brenda L.: *See—*
Boudreault, Robert H.; Boudreault, Mark A.; and Boudreault, Brenda L., 4,182,589, Cl. 409-138.000.
Boudreault, Mark A.: *See—*
Boudreault, Robert H.; Boudreault, Mark A.; and Boudreault, Brenda L., 4,182,589, Cl. 409-138.000.
Boudreault, Robert H.; Boudreault, Mark A.; and Boudreault, Brenda L. Corner chamfering machine. 4,182,589, Cl. 409-138.000.
Boughton, Morris W. Multi-channel vascular flow monitoring system. 4,182,314, Cl. 128-693.000.
Boveia, Clark E., to Clark-Way Leveling Systems, Inc. Load-leveling base. 4,182,506, Cl. 248-656.000.
Bracher, Bernhard, to Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten. Wafer support. 4,182,265, Cl. 118-500.000.
Brackett, Donald L.: *See—*
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., 4,182,271, Cl. 119-28.000.
Braddock, Peter D. M.: *See—*
Tobe, Martin L.; Khokhar, Abdul R.; and Braddock, Peter D. M., 4,182,724, Cl. 260-429.00R.
Bradley, Frances L.: *See—*
Bradley, John J.; and Bradley, Frances L., 4,181,989, Cl. 5-509.000.
Bradley, John J.; and Bradley, Frances L. Mattress elevating device. 4,181,989, Cl. 5-509.000.
Brambilla, Giuliano, to Societe Italiana Telecomunicazioni Siemens S.p.A. Band-pass/band-stop filter for telecommunication system. 4,182,997, Cl. 333-175.000.
Brandman, Harold A.: *See—*
Virgilio, Joseph A.; Wood, Thomas F.; Heilweil, Emanuel; and Brandman, Harold A., 4,182,730, Cl. 260-599.000.
Brauer, Hans; and Diel, Hartmut, to Friedrich Kocks GmbH & Company. Rolling mills. 4,182,147, Cl. 72-224.000.
Braun, Albert: *See—*
Strauss, Georg; Portz, Wilhelm; Braun, Albert; Kandler, Joachim; Komorniczyk, Klaus; and Thiel, Hans-Dieter, 4,182,626, Cl. 75-58.000.
Braunberger, Horst: *See—*
Beige, Gunter; and Braunberger, Horst, 4,182,318, Cl. 128-77.000.
Break, Douglas G. Gutter spike remover. 4,182,016, Cl. 29-275.000.
Brecker, James N.: *See—*
Shum, Lanson Y.; and Brecker, James N., 4,182,981, Cl. 324-61.00R.
Breithaupt, David W., to RCA Corporation. Remote control TV subcarrier phase shifter system. 4,183,044, Cl. 358-17.000.
Brettschneider, Johannes: *See—*
Zeller, Hans; Latsch, Reinhard; Brettschneider, Johannes; and Bianchi, Valerio, 4,182,295, Cl. 123-119.0EC.
Bretzger, Reinhard; Kienle, Fritz; and Lindenthal, Hans, to Voith Transmit GmbH. Method for installing a bearing in a universal coupling. 4,182,011, Cl. 29-148.40A.
Brewer, Arthur D.: *See—*
Znotins, Andrew A.; and Brewer, Arthur D., 4,182,716, Cl. 549-14.000.
Briel, Adriaan Z. A.; and Charnock, John. Reflux valve. 4,182,355, Cl. 137-496.000.
Briggs, Paul C., Jr.; and Muschiatti, Lawrence C., to Du Pont de Nemours, E. I., and Company. Polymer in monomer adhesive composition and method employing same. 4,182,644, Cl. 156-310.000.
Bright, James A.: *See—*
Deaton, Homer W.; and Bright, James A., 4,182,351, Cl. 134-58.00D.
Brindle, Dannie K.; and Shanfelt, Donald Y., to Shanfelt, Donald; Brindle, Dannie K.; Kiser, Dennis D.; Armagast, David W.; and Lynch, Patrick J., part interest to each. Inflatable solar energy collector. 4,182,307, Cl. 126-432.000.
Bristol-Myers Company: *See—*
Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., 4,182,863, Cl. 544-26.000.
Ueda, Yasutsugu, 4,182,711, Cl. 548-178.000.
Brito, Manuel J.: *See—*
Ferreira, Richard A.; and Brito, Manuel J., 4,182,497, Cl. 239-532.000.
Britton, John W.; and Cannell, John N., to Her Majesty the Queen in right of Great Britain, as represented by the Minister of National Defence. Airstream pressure sensing probes. 4,182,188, Cl. 73-721.000.
Broman, Rodney L.: *See—*
Ahnell, Joseph E.; Broman, Rodney L.; and Waters, John R., 4,182,656, Cl. 435-34.000.
Brooks, David S.; and Savage, Trevor C., to Electroheating (London) Limited. Transformers for induction heating equipment. 4,183,001, Cl. 336-62.000.
Brooks, Seville R., to Marconi Company Limited, The. Side-looking radar systems. 4,183,024, Cl. 343-5.0ST.
Brother Kogyo Kabushiki Kaisha: *See—*
Yoneji, Satoshige; Higuchi, Yoshiharu; and Mori, Shushin, 4,182,252, Cl. 112-317.000.
Brower, Jerome S. Underwater cutting rod. 4,182,947, Cl. 219-70.000.
Brown, Allen C.: *See—*
Eyrick, Theodore B.; Brown, Allen C.; and Hattes, Neil R., 4,182,599, Cl. 417-328.000.
Brown, John S.: *See—*
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,182,231, Cl. 99-387.000.
Bruce, Ray F.; and Byrd, William W., Jr., to Bruce, Ray F. Wood burning stove. 4,182,302, Cl. 126-4.000.
Bruno, Edward C.; and Reeme, Harvey D., to Polycraft Corporation. Plastic sheet perforating and cutting machine. 4,182,208, Cl. 83-118.000.

Bruynes, Cornelis A.; and de Koning, Jan J., to Gist-Brocades N.V. Preparation of 3-bromomethyl-3-cephem sulfoxides. 4,182,870, Cl. 544-16.000.

Bryson, Charles E., Jr.: *See*—
Markum, Thomas R.; and Bryson, Charles E., Jr., 4,182,948, Cl. 219-541.000.

Buchanan, Harry C., Jr.; and Hussey, James L., to General Motors Corporation. Antenna mount for a vehicle radio antenna. 4,183,026, Cl. 343-715.000.

Buchanan, Michael D.: *See*—
Dalke, George W.; and Buchanan, Michael D., 4,183,046, Cl. 358-22.000.

Buckeye International, Inc.: *See*—
Johnson, Clark E., Jr.; and Main, William F., 4,183,028, Cl. 346-35.000.

Buckler, Robert T., to Miles Laboratories, Inc. Reagents for use in binding assays to determine diphenylhydantoin. 4,182,856, Cl. 536-4.000.

Buckley, Lawrence W.; and Bennett, Richard N., to National Instrument Company, Inc. Automatic filling machine. 4,182,387, Cl. 141-129.000.

Budge, Daniel C.: *See*—
McClean, William G.; and Budge, Daniel C., 4,183,014, Cl. 340-204.000.

Buff, George J., Jr. Sanitary container. 4,182,462, Cl. 220-450.000.

Buhler, Eugen. Method and device for the production of casting molds out of sand containing a binder. 4,182,395, Cl. 164-7.000.

Bulten-Kanthal AB: *See*—
Dock, Carl G.; and Schrewelius, Nils G., 4,182,189, Cl. 73-761.000.

Bundy Corporation: *See*—
Millar, Barry C.; and Little, Keith W., 4,182,206, Cl. 83-56.000.

Bunes, Leonard A., to Dynapol. Red colors. 4,182,885, Cl. 546-76.000.

Bunker Ramo Corporation: *See*—
Dadian, Thomas F., 4,182,435, Cl. 188-72.700.
Nijman, John P., 4,182,029, Cl. 29-749.000.

Bunyan, Thomas W., to Pilgrim Engineering Developments Limited. Sealing arrangements. 4,182,518, Cl. 277-65.000.

Burkart, Robert C.; and Newbould, Gilbert J. Positive feed drill. 4,182,588, Cl. 408-14.000.

Burke, James E., to Ethyl Products Company. Actuator button for fluid dispenser. 4,182,496, Cl. 239-492.000.

Burke, Richard G.; and Kolodzey, James S., to International Business Machines Corp. Pin photodiode and integrated circuit including same. 4,183,034, Cl. 357-30.000.

Burkhardt, James H., Jr.; Henry, J. James; and Davenport, Clyde M., to United States of America, Energy. Beam/seam alignment control for electron beam welding. 4,183,055, Cl. 358-101.000.

Burney, Ivan T.; and Moy, Tsoy K., to Westinghouse Electric Corp. Discharge assembly for an axial flow compressor. 4,182,595, Cl. 415-204.000.

Burroughs Corporation: *See*—
Sellen, Kenneth R., 4,182,388, Cl. 141-351.000.

Burstell, Helmut: *See*—
Soder, Alfons; Bieringer, Hermann; Burstell, Helmut; Langeluddeke, Peter; and Sachse, Burkhard, 4,182,624, Cl. 71-92.000.

Burton, Charles L.; and Teigen, Bard C., to Combustion Engineering, Inc. Steam separator to reduce carryunder. 4,182,277, Cl. 122-491.000.

Burton, George: *See*—
Taylor, Andrew W.; Burton, George; and Clayton, John P., 4,182,710, Cl. 260-245.200.

Burton, Guy C.: *See*—
Ziebarth, Timothy D.; Hauser, Ray L.; Thompson, James R.; Harris, John F.; Gibbons, Michael P.; and Burton, Guy C., 4,182,423, Cl. 175-61.000.

Burton/Hawks Inc.: *See*—
Ziebarth, Timothy D.; Hauser, Ray L.; Thompson, James R.; Harris, John F.; Gibbons, Michael P.; and Burton, Guy C., 4,182,423, Cl. 175-61.000.

Busch, Richard E., to Addmaster Corporation. Latching device. 4,182,539, Cl. 312-333.000.

Butterworth, Edmund M., to Eaton Corporation. Push button device. 4,182,943, Cl. 200-159.00R.

Byrd, William W., Jr.: *See*—
Bruce, Ray F.; and Byrd, William W., Jr., 4,182,302, Cl. 126-4.000.

C.P. Hall Company, The: *See*—
Kuceski, Vincent P., 4,182,844, Cl. 528-335.000.

Cablestrand: *See*—
Henry, Michael E., 4,182,106, Cl. 57-212.000.

Calderon, Arthur, Jr.; Hennenfent, Douglas J.; and Holmstrand, Allan L., to Control Data Corporation. Method of forming gaps in magnetic heads. 4,182,643, Cl. 156-151.000.

Calle, Daniel G., to Compagnie General d'Entretien et de Reparation - Coger. Installation for distributing refrigerated air in containers. 4,182,135, Cl. 62-419.000.

Camp, Hope H., Jr. Exerciser device. 4,182,511, Cl. 272-145.000.

Camp, Nat. Steam-air inhalator. 4,182,325, Cl. 128-203.270.

Campos, Jose G.: *See*—
Lombana, Luis A.; and Campos, Jose G., 4,182,246, Cl. 110-188.000.

Candu Packing (Ontario) Limited: *See*—
O'Brien, Theodore E., 4,182,237, Cl. 100-35.000.

Cannell, John N.: *See*—
Britton, John W.; and Cannell, John N., 4,182,188, Cl. 73-721.000.

Canon Kabushiki Kaisha: *See*—
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Iwashita, Tomonori; and Shimizu, Masami, 4,182,557, Cl. 354-60.00R.
Iwashita, Tomonori; Uchidoi, Masanori; Ichiyanagi, Toshikazu; Taguchi, Tetsuya; Iura, Yukio; and Aizawa, Hiroshi, 4,182,562, Cl. 354-173.000.
Yoshihara, Satoshi; and Sekimura, Nobuyuki, 4,182,647, Cl. 430-314.000.

Cargill Inc.: *See*—
McNeff, Larry C., 4,182,755, Cl. 424-147.000.

Cargill, James M. Diffuser. 4,182,632, Cl. 127-5.000.

Carle, Jean-Claude A., to Societe Anonyme des Fonderies et Ateliers L. CHOQUENET. Device for filtration under pressure of solid particles contained in liquids. 4,182,680, Cl. 210-386.000.

Carlson, F. Paul; and Mitchell, Gordon L., to United States of America, Navy. Low frequency detection system. 4,183,009, Cl. 367-117.000.

Carrier Corporation: *See*—
DeWolfe, Douglas; Sturley, Richard A.; and McPhilmy, Francis E., 4,182,985, Cl. 324-220.000.
Haas, Rudy E.; Smorol, Michael E.; and Hayes, Richmond S., 4,182,133, Cl. 62-93.000.
Nelson, Dana W., 4,181,998, Cl. 15-104.140.
Wellman, Donald C., 4,182,596, Cl. 415-207.000.

Carson, Don B.; and Purse, Frank V., to UOP Inc. Fluid distributor for fixed-bed catalytic reaction zones. 4,182,741, Cl. 422-211.000.

Carter, Joe M.; Lever, Clyde J., Jr.; and Scheidt, Gerald A., to Western Electric Company, Inc. Method of forming S–Z twisted strand units. 4,182,107, Cl. 57-293.000.

Casaert, Rene; and Pavy, Michel, to Nortene. Method of manufacturing helical members from a synthetic extruded material. 4,182,738, Cl. 264-210.200.

Casio Computer Co., Ltd.: *See*—
Kashio, Toshio, 4,182,113, Cl. 58-4.00A.

Casolo, Angelo J., to Almag Chemical Corp. Method and system for purifying liquid. 4,182,676, Cl. 210-27.000.

Cason, George A., Jr., to Dresser Industries, Inc. Rotary rock bit bearing pin hardfacing method and apparatus. 4,182,394, Cl. 164-4.000.

Cassidy, Robert E.; Latassa, Frank M.; Roy, J. Arthur; and Ray, John G., to GTE Sylvania Incorporated. Mercury-containing glass-capsule dispenser for discharge lamps. 4,182,971, Cl. 313-177.000.

Castelluzzo, James M., to T.M. Invention Associates. Multi-layer graphic arts tape system. 4,182,789, Cl. 428-40.000.

Casten, George P.; McKinney, Gordon R.; Newton, Roger E.; Tompkins, E. Crosby; and Weikel, John H., Jr., to Mead Johnson & Company. Buspirone anti-anxiety method. 4,182,763, Cl. 424-251.000.

Catanese, Carmen A.; and Endriz, John G., to RCA Corporation. Electron multiplier device with surface ion feedback. 4,182,969, Cl. 313-105.00R.

Caterpillar Tractor Co.: *See*—
Earle, Michael; and Lenzen, Glenn H., 4,182,299, Cl. 123-188.00R.
Grant, John W., 4,182,195, Cl. 74-473.0SW.
Herr, Charles H., Jr., 4,182,166, Cl. 73-134.000.
Klett, Gene R.; and Thies, Jerome A., 4,182,057, Cl. 37-141.00T.
Livesay, Richard E.; and Wright, Paul L., 4,182,578, Cl. 403-317.000.
Spivey, William J., Jr., 4,182,125, Cl. 60-431.000.
Stratton, Michael K.; Engquist, Karl R.; Keske, Frank E.; Powers, Harold C.; and Sparks, James D., 4,182,122, Cl. 60-322.000.

Caunt, Anthony D.; Fortuin, Michael S.; and Williams, Ian G., to Imperial Chemical Industries Limited. Olefine polymerization process. 4,182,816, Cl. 526-119.000.

Ceauselu, Constantin O., to Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst. Plant for pneumatic transport. 4,182,243, Cl. 104-138.00R.

Cecil, John, Jr. Razor with handle to store a blade unit or cartridge. 4,182,031, Cl. 30-47.000.

Celanese Polymer Specialties Company: *See*—
Hicks, Darrel D., 4,182,831, Cl. 528-103.000.
Hicks, Darrell D., 4,182,833, Cl. 528-120.000.

Cenker, Ronald P.; Fleming, Thomas W.; and Huff, Frank R., to Bell Telephone Laboratories, Incorporated. Self checking dynamic memory system. 4,183,096, Cl. 365-222.000.

Cerefice, Steven A.: *See*—
Fields, Ellis K.; Cerefice, Steven A.; and Paschke, Edward E., 4,182,847, Cl. 528-361.000.

Chae, Yung B.; and Kim, Dae W., to Hoechst Aktiengesellschaft. Optical resolution of amino acids into optical antipodes. 4,182,899, Cl. 560-142.000.

Chalmers, Richard J.: *See*—
Mayhew, Roger D.; and Chalmers, Richard J., 4,182,201, Cl. 74-713.000.

Champion International Corporation: *See*—
Dutcher, Daniel P., 4,182,224, Cl. 93-39.00R.
Vassiliades, Anthony E.; and Vincent, David N., 4,182,788, Cl. 428-40.000.

Chan, Hak-Foon, to Rohm and Haas Company. Process for the preparation of 1,3-disubstituted-2-azoyl-2-propen-1-ones. 4,182,862, Cl. 542-440.000.

Chang, Sing-Hsiung. Hydrophilic, soft and oxygen permeable copolymer composition. 4,182,822, Cl. 526-264.000.

Chapman, Charles C., to Phillips Petroleum Company. HF alkylation process utilizing fractionation zones at different pressures and including indirect heat exchange. 4,182,924, Cl. 585-712.000.

Chapman, Charles C., to Phillips Petroleum Company. Alkylation effluent recovery system. 4,182,925, Cl. 585-719.000.

Charnock, John: *See—*
Briel, Adriaan Z. A.; and Charnock, John, 4,182,355, Cl. 137-496.000.
Chatfield, Glen F., to Duquesne Systems, Inc. Method of operating a multiprogrammed computing system. 4,183,083, Cl. 364-200.000.
Chemetron Corporation: *See—*
Eyrick, Theodore B.; Brown, Allen C.; and Hattes, Neil R., 4,182,599, Cl. 417-328.000.
Switzer, William K.; and Wagner, Roland W., 4,182,207, Cl. 83-61.000.
Chemische Fabrik Kalk GmbH: *See—*
Jenkner, Herbert; and Strang, Robert, 4,182,706, Cl. 260-45.95G.
Chemische Werke Huels, A.G.: *See—*
Bernemann, Paul; Kentschke, Rudolf; and Wieland, Dieter, 4,182,814, Cl. 526-92.000.
Chen, Peter C.: *See—*
Cohen, Jerome; and Chen, Peter C., 4,182,023, Cl. 29-571.000.
Chen, Robert H. K., to Ortho Pharmaceutical Corp. Total synthesis of the utero-evacuant substance d,l-zoapatanol. 4,182,717, Cl. 260-333.000.
Cherkofsky, Saul C.; and Sharpe, Thomas R., to Du Pont de Nemours, E. I., and Company. Anti-inflammatory 1-substituted-4,5-diaryl-2-(substituted-thio) imidazoles and their corresponding sulfoxides and sulfones. 4,182,769, Cl. 424-273.00R.
Chess, William B., to Stauffer Chemical Company. Egg yolk extender. 4,182,779, Cl. 426-558.000.
Chevali, Harihar D.; and Evans, Thomas A., to General Electric Company. Photoflash lamp unit utilizing radiation and voltage responsive switch devices. 4,182,608, Cl. 431-359.000.
Chevalier, Serge: *See—*
Roullet, Gerald; Bortuzzo, Jean-Pierre; and Chevalier, Serge, 4,183,069, Cl. 360-102.000.
Chihara, Hiroyuki, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece correction circuit. 4,182,108, Cl. 58-4.00A.
Chimet S.p.A.: *See—*
Squarcialupi, Sergio, 4,182,671, Cl. 204-276.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt: *See—*
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resofszki, Gabor; and Gneth nee Zalantai, Livia, 4,182,892, Cl. 549-79.000.
Chinook Manufacturing Co.: *See—*
Johnson, William R., 4,182,305, Cl. 126-120.000.
Chown, Martin, to International Standard Electric Corporation. Optical fiber data transmission system. 4,182,935, Cl. 179-15.0AL.
Christensen, Allison L.: *See—*
Lestak, Robert G.; and Christensen, Allison L., 4,182,379, Cl. 138-149.000.
Christenson, James G., to Hoffmann-La Roche Inc. N-[3-methyl-4-(2-methyl-4-oxo-3,4-dihydro-quinazolin-3-yl)phenyl]succinamic acid. 4,182,879, Cl. 544-290.000.
Christmann, Richard M.: *See—*
Coffin, Calvin B.; and Christmann, Richard M., 4,182,990, Cl. 325-364.000.
Chronic, Bill M. Jet propulsion engine. 4,182,118, Cl. 60-221.000.
Chrysler Corporation: *See—*
Hall, John F., 4,182,121, Cl. 60-313.000.
Chu, Chin-Chiun, to Mobil Oil Corporation. Disproportionation of toluene. 4,182,923, Cl. 585-475.000.
Chubb & Son's Lock & Safe Co. Ltd.: *See—*
Tippin, Arthur D.; and White, Malcolm J., 4,182,145, Cl. 70-134.000.
Chupp, Thomas M., Jr. Exercise device. 4,182,509, Cl. 272-93.000.
Churchman, Ronald K., to Otis Engineering Corporation. Pressure testing tool. 4,182,159, Cl. 73-40.50R.
Ciba-Geigy Aktiengesellschaft: *See—*
Kitzing, Rainer; Scott, John G. V.; Webb, Terence C.; and Evans, Graham, 4,182,886, Cl. 546-304.000.
Ciba-Geigy Corporation: *See—*
Markert, Jurgen; and Morawietz, Hans, 4,182,882, Cl. 546-31.000.
Spivack, John D., 4,182,704, Cl. 260-45.8NT.
Zondler, Helmut; Moser, Roland; and Audykowski, Thaddeus, 4,182,832, Cl. 528-103.000.
Cipher Data Products, Incorporated: *See—*
Barton, Jr., William M., 4,183,068, Cl. 360-90.000.
Citizen Watch Co., Ltd.: *See—*
Tamaru, Munetaka, 4,182,111, Cl. 58-23.00R.
Teramoto, Kazuo, 4,182,109, Cl. 58-4.00R.
Clark, Bruce A. Pattern plate and pattern match plate assembly. 4,182,396, Cl. 164-243.000.
Clark, Donald G.; and Preston, Anthony, to Pilkington Glass Industries Limited. Apparatus for inspecting flat glass. 4,182,575, Cl. 356-430.000.
Clark-Way Leveling Systems, Inc.: *See—*
Boveia, Clark E., 4,182,506, Cl. 248-656.000.
Clarke, John E.: *See—*
Wang, Cheng-Chi; Pasko, John G.; Longo, Joseph T.; and Clarke, John E., 4,183,035, Cl. 357-30.000.
Clausing, Challiss I., to Gould Inc. Shutter for disconnect contacts of circuit breaker cubicle. 4,183,073, Cl. 361-345.000.
Clayton, John P.: *See—*
Taylor, Andrew W.; Burton, George; and Clayton, John P., 4,182,710, Cl. 260-245.200.
Clement, Anton. Connecting element for link chain strands of plough or conveyor chains employed in underground mining. 4,182,116, Cl. 59-93.000.
Cleveland, Lewis C.; and Smith, Howard W., to General Electric Company. Load-break fuse equipment. 4,183,003, Cl. 337-156.000.
Coakwell, Charles A. Combustion system for internal combustion engines. 4,182,278, Cl. 123-1.00A.
Coast Foundry & Mfg. Co.: *See—*
Gilbert, Russell T.; and Antunez, Armand E., Jr., 4,182,364, Cl. 137-426.000.
Cober Electronics, Inc.: *See—*
Wayne, I. R.; and Krieger, Bernard, 4,182,946, Cl. 219-10.55A.
Cobin, Robert B. Musical instrument hanger and cover therefor. 4,182,505, Cl. 248-220.400.
Coffin, Calvin B.; and Christmann, Richard M., to Interstate Electronics Supply, Inc. Radar receiver and method of indicating range to a radar source. 4,182,990, Cl. 325-364.000.
Cohen, Jerome; and Chen, Peter C., to NCR Corporation. Process for minimum overlap silicon gate devices. 4,182,023, Cl. 29-571.000.
Cohen, Noal; and Saucy, Gabriel, to Hoffman-La Roche Inc. Synthesis of optically active vitamin E. 4,182,719, Cl. 260-340.90R.
Cojocaro, Adriana: *See—*
Youval, Anat; Frommer, Moshe A.; Movshovich, Shmuel; and Cojocaro, Adriana, 4,182,582, Cl. 405-45.000.
Coker, Thomas G.: *See—*
Argade, Shyam D.; and Coker, Thomas G., 4,182,670, Cl. 204-252.000.
Colgate-Palmolive Company: *See—*
Schaar, Charles H., 4,182,333, Cl. 128-287.000.
Colle, Edward D.: *See—*
Parke, James G.; Norman, Richard O.; Colle, Edward D.; and Fussell, Edsel M., 4,182,491, Cl. 239-11.000.
Collins, Edward J.; and Sterling, Vaughn C., to General Electric Company. Photoflash lamp unit utilizing radiation and voltage responsive switch devices. 4,182,607, Cl. 431-359.000.
Collins, Joseph C.; and Diana, Guy D., to Sterling Drug Inc. 4-[6-(4-Cyanophenoxy)hexyl]-3,5-heptanedione. 4,182,727, Cl. 260-465.00F.
Collins, Joseph C., to Sterling Drug Inc. Arylvinyl cyclopropyl ketones. 4,182,729, Cl. 260-590.00C.
Collins, Joseph C.; and Diana, Guy D., to Sterling Drug Inc. Acyloxy-substituted aryloxyalkyl diketones. 4,182,761, Cl. 424-248.550.
Colorguard Corporation: *See—*
Ingraham, Glen E., 4,182,382, Cl. 140-3.00R.
Colpaert, James J.: *See—*
Kluger, Michael A.; and Colpaert, James J., 4,182,439, Cl. 188-335.000.
Combette, Marc; and Luthringer, Jean, to Societe de Prospection et d'Inventions Techniques, SPIT. Expansion core anchor. 4,182,218, Cl. 85-84.000.
Combis, Chris: *See—*
Moore, Harry O., 4,182,952, Cl. 200-80.00R.
Combustion Engineering, Inc.: *See—*
Burton, Charles L.; and Teigen, Bard C., 4,182,277, Cl. 122-491.000.
Rickard, Earl K., 4,182,359, Cl. 137-246.220.
Combustion Research & Technology, Inc.: *See—*
Albert, Albert A.; and Porter, Kenneth W., 4,182,492, Cl. 239-92.000.
Cometta, Robert A., to National Semiconductor Corporation. Automatic control of integrated circuit trimming. 4,182,024, Cl. 29-571.000.
Commonwealth Scientific and Industrial Research Organization: *See—*
Harris, Roger L. N.; Huppatz, John L.; Phillips, John N.; and Witrzens, Barbara, 4,182,877, Cl. 544-172.000.
Compagnie Francaise des Petroles: *See—*
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Compagnie General d'Entretien et de Reparation - Coger: *See—*
Calle, Daniel G., 4,182,135, Cl. 62-419.000.
Compagnie Generale d'Electricite: *See—*
Courrier, Gilbert; Duchet, Michel; Leblanc, Michele; and Moirez, Jacques, 4,182,570, Cl. 356-28.000.
Compagnie Industrielle des Lasers: *See—*
Courrier, Gilbert; Duchet, Michel; Leblanc, Michele; and Moirez, Jacques, 4,182,570, Cl. 356-28.000.
Compagnie International pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See—*
Maussion, Daniel, 4,182,481, Cl. 235-449.000.
Comptrol, Inc.: *See—*
Desch, John B., 4,182,168, Cl. 73-140.000.
Comstock, Lewis D.: *See—*
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., 4,182,271, Cl. 119-28.000.
Concrete Industries (Monier) Limited: *See—*
Stewart, Alan G.; Whiteford, John; and Emmett, William J., 4,182,245, Cl. 110-101.0CF.
Confalonieri, Giovanni: *See—*
Piccardi, Paolo; Confalonieri, Giovanni; Ramella, Pier G.; and Da Col, Lino, 4,182,893, Cl. 424-273.00B.
Connelly, Richard E., to Contractor Equipment Manufacturers, Inc. Tamper-proof poisonous bait box. 4,182,070, Cl. 43-131.000.
Conoco, Inc.: *See—*
Oster, Clarence, 4,182,537, Cl. 308-4.00A.
Consoli, Ronald P.: *See—*
Marshall, Ralph C.; and Consoli, Ronald P., 4,182,131, Cl. 62-91.000.
Construction Specialties, Inc.: *See—*
Porumbescu, Alexandra A., 4,182,093, Cl. 52-663.000.
Continental Can Company, Inc.: *See—*
Holk, Albert J., Jr.; and Boik, Arnold R., 4,182,460, Cl. 220-271.000.
Contractor Equipment Manufacturers, Inc.: *See—*
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Control Data Corporation: *See—*
Calderon, Arthur, Jr.; Hennenfent, Douglas J.; and Holmstrand, Allan L., 4,182,643, Cl. 156-151.000.
Cook, Harry M. Interlocking building block. 4,182,089, Cl. 52-284.000.
Cooke, Brian A., to Imperial Chemical Industries Limited. Coating process with voltammetric sensing of the coating solution. 4,182,638, Cl. 148-6.15R.
Coon, James A. Method for making file teeth. 4,182,204, Cl. 76-24.00R.
Cooper, Ronald H.; Goreham, Kenneth A.; and Wakeford, Christopher B., to Smiths Industries Limited. Electrical igniters. 4,182,009, Cl. 29-25.120.
Copa, William M.: *See—*
Pradt, Louis A.; and Copa, William M., 4,182,648, Cl. 162-38.000.
Core-Lock Foam, Inc.: *See—*
Fitts, Martin E., 4,182,641, Cl. 156-77.000.
Corning Glass Works: *See—*
Schlicker, Melvin C., 4,182,500, Cl. 242-118.700.
Cosden Technology, Inc.: *See—*
Watson, James M., 4,182,658, Cl. 203-9.000.
Cossitt, Forrest T. Support apparatus. 4,182,432, Cl. 182-151.000.
Costa, Eugene, Jr.; and Godsay, Madhu P., to International Paper Company. Production of high crimp, high strength, hollow rayon fibers. 4,182,735, Cl. 264-54.000.
Cotti, Gino: *See—*
Croci, Marco; and Cotti, Gino, 4,182,709, Cl. 260-239.100.
Cottrell, Walter D., Jr.; and Lawson, Ernest E., to Owens-Corning Fiberglas Corporation. Method of making molding compounds and products produced thereby. 4,182,701, Cl. 260-38.000.
Coulter Electronics, Inc.: *See—*
Agrawala, Ashok K.; Kulkarni, Ashok V.; and Paul, Edwin H., Jr., 4,183,013, Cl. 340-146.3AC.
Coulter, John P.: *See—*
Gibson, James D. M.; Houlbrook, Kenneth; and Coulter, John P., 4,182,264, Cl. 118-306.000.
Courrier, Gilbert; Duchet, Michel; Leblanc, Michele; and Moirez, Jacques, to Compagnie Industrielle des Lasers; Compagnie Generale d'Electricite; and "Societe d'Optique, Precision Electronique et Mecanique" Sopelem. Device for measuring a component of wind speed. 4,182,570, Cl. 356-28.000.
Coutin, Pierre F.: *See—*
Hasquenoph, Jean H.; and Coutin, Pierre F., 4,182,502, Cl. 244-137.00R.
Covington, William S., to Permavision. Ocular membrane and method for preparation thereof. 4,182,723, Cl. 260-37.0SB.
Cowpland, Michael C. J.: *See—*
Beirne, Patrick R.; Cowpland, Michael C. J.; and Whitbread, Raymond J., 4,182,936, Cl. 179-18.0AH.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. Tetrazole derivatives of [1-oxo-2-aryl or thienyl-2-substituted-5-indanyloxy(or thio)]alkanoic acids. 4,182,764, Cl. 424-262.000.
Crist, Ralph P., to United States of America, Navy. Noise making device. 4,183,008, Cl. 367-142.000.
Croci, Marco; and Cotti, Gino, to Glaxo Group Limited. Manufacture of semi-synthetic penicillin antibiotics. 4,182,709, Cl. 260-239.100.
Crooks, Melvin. Building construction of A-shaped elements. 4,182,086, Cl. 52-81.000.
Crutchfield, Marvin M.; and Upton, Charles J., to Monsanto Company. 1,3-Dioxolane and 1,3-dioxane polycarboxylates, and precursors thereof. 4,182,718, Cl. 260-340.700.
Crutchfield, Marvin M.; Papanu, Victor D.; and Upton, Charles J., to Monsanto Company. Ether dicarboxylates. 4,182,900, Cl. 560-180.000.
Csatary, Laszlo K. Intra-uterine contraceptive device. 4,182,321, Cl. 128-130.000.
Culotta, Randolph F.; and Posey, Donald L., to United States of America, National Aeronautics and Space Administration. Static pressure orifice system testing method and apparatus. 4,182,158, Cl. 73-40.000.
Curfman, Don C.; and Rea, Gary D., to Borg-Warner Corporation. Process for polymerization of styrene and acrylonitrile. 4,182,820, Cl. 526-212.000.
Currah, Walter E., Jr.: *See—*
Harper, George W.; and Currah, Walter E., Jr., 4,182,594, Cl. 415-2.000.
Currie, Kenneth F. Irradiation unit. 4,182,047, Cl. 34-1.000.
Curtis, Robert M., to Shiley Incorporated. Blood oxygenator. 4,182,739, Cl. 422-47.000.
Cutler, John H.; and Walker, Loren H., to General Electric Company. Inverter system including commutation failure prevention scheme. 4,183,081, Cl. 363-81.000.
Czuba, Boleslaw J. Combustion chamber and piston therefor. 4,182,283, Cl. 123-50.00R.
Da Col, Lino: *See—*
Piccardi, Paolo; Confalonieri, Giovanni; Ramella, Pier G.; and Da Col, Lino, 4,182,893, Cl. 424-273.00B.
Dacor Corporation: *See—*
Pedersen, Vernon G., 4,182,323, Cl. 128-204.250.
Dadian, Thomas F., to Bunker Ramo Corporation. Cam actuated disk brake mechanism. 4,182,435, Cl. 188-72.700.
Daicel Ltd.: *See—*
Hozumi, Yukio; Kuwayama, Tuguo; and Kuroda, Yosinori, 4,182,854, Cl. 528-500.000.
Daidotokushuko Kabushikikaisha: *See—*
Mizuno, Susumu; and Imagawa, Hiroshi, 4,182,610, Cl. 432-237.000.
Daikin Kogyo Co., Ltd.: *See—*
Saegusa, Takeo; Yamada, Akira; Iwase, Masaaki; and Iwatani, Akitoshi, 4,182,846, Cl. 528-341.000.
Daimler-Benz Aktiengesellschaft: *See—*
Hornig, Rudolf; Beeskow, Bruno; and Worner, Gunter, 4,182,139, Cl. 64-12.000.
Huber, Guntram; and Schmid, Walter, 4,182,190, Cl. 73-794.000.
Dalebout, Melvin W., to Engineered Sports Products, Inc. Pliable inner boot and injectable fit packs for ski boots. 4,182,056, Cl. 36-117.000.
Dalgleish, Jack F.: *See—*
Lukas, Helmut H.; and Dalgleish, Jack F., 4,182,546, Cl. 350-96.210.
Dalke, George W.; and Buchanan, Michael D., to Interpretation Systems Incorporated. Electronic apparatus for converting digital image or graphics data to color video display formats and method therefor. 4,183,046, Cl. 358-22.000.
Dana Corporation: *See—*
Anderson, George J.; and Bell, Roscoe L., 4,182,014, Cl. 29-173.000.
Danfoss A/S: *See—*
Baatrup, Johannes V., 4,182,219, Cl. 91-186.000.
Block, Albert, 4,182,012, Cl. 29-156.50A.
Danielsson, Ulf H.: *See—*
Wennberg, Lennart A.; and Danielsson, Ulf H., 4,182,172, Cl. 73-194.00B.
Dartnell, Jack. Pedal control units. 4,182,198, Cl. 74-513.000.
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Iwashita, Tomonori; and Shimizu, Masami, to Canon Kabushiki Kaisha. Single lens reflex camera capable of high speed continuous photography. 4,182,557, Cl. 354-60.00R.
Daughton, John W.; Gillett, Kenneth; and Nelson, Frank M., to Xerox Corporation. Data communications system for a reproduction machine having a master and secondary controllers. 4,183,089, Cl. 364-900.000.
Daum, Gerhard: *See—*
Schmidt, Hans-Georg; Daum, Gerhard; and Vogt, Wilhelm, 4,182,910, Cl. 568-595.000.
Davenport, Clyde M.: *See—*
Burkhardt, James H., Jr.; Henry, J. James; and Davenport, Clyde M., 4,183,055, Cl. 358-101.000.
David, Samuel: *See—*
Asai, Akiji; Ban, Ivan; David, Samuel; and Thies, Peter W., 4,182,889, Cl. 546-197.000.
Davis, Gordon P., to E M I Limited. X-ray generating tubes. 4,182,955, Cl. 250-402.000.
Davis, Wilbur M.; Sawyer, Bobby G.; and Nichols, John A., to Deere & Company. Impeller mower-conditioner rotor. 4,182,099, Cl. 56-16.400.
Davy International Aktiengesellschaft: *See—*
Anwer, Jamil; Sud, Kuldip K.; and Wintrup, Karl, 4,182,659, Cl. 203-18.000.
Dawson, Wayne G. Watch spring bar kit. 4,182,153, Cl. 72-414.000.
Day, James L., to James L. Day Co. Inc. Pneumatic terminal and gauge assembly. 4,182,367, Cl. 137-557.000.
Day, Timothy T. Packaging bulk commodities. 4,182,095, Cl. 53-86.000.
DBX Inc.: *See—*
Blackmer, David E., 4,182,930, Cl. 179-1.00R.
Tyler, Leslie B., 4,182,993, Cl. 330-279.000.
Dean, Joe O. Rotary internal combustion engine. 4,182,301, Cl. 123-246.000.
Deaton, Homer W.; and Bright, James A., to White Consolidated Industries, Inc. Gentle cycle valve for digital dishwasher. 4,182,351, Cl. 134-58.00D.
DeCaro, Charles J., to Textron, Inc. Collapsible threaded insert device for plastic workpieces. 4,182,216, Cl. 85-70.000.
Deere & Company: *See—*
Davis, Wilbur M.; Sawyer, Bobby G.; and Nichols, John A., 4,182,099, Cl. 56-16.400.
Deggendorfer Werft und Eisenbau GmbH: *See—*
Laber, Walter, 4,182,408, Cl. 165-70.000.
De Haas, Franciscus C. M.: *See—*
Vrijssen, Gerardus A. H. M.; and De Haas, Franciscus C. M., 4,182,973, Cl. 313-456.000.
de Koning, Jan J.: *See—*
Bruynes, Cornelis A.; and de Koning, Jan J., 4,182,870, Cl. 544-16.000.
Delaney, Richard P. Rectal catheter. 4,182,332, Cl. 128-283.000.
Dellorfano, Fred M., Jr.: *See—*
Massa, Frank, 4,183,011, Cl. 134-184.000.
del Ser Gonzalez, Clemente. Stuffing apparatus utilizing a magazine. 4,182,233, Cl. 99-494.000.
de Nevers, Noel H., to Oros Company. Countercurrent heat transfer apparatus and method. 4,182,400, Cl. 165-1.000.
Denk, Heimo, to List, Hans. Measuring device for measuring the angle of rotation of a machine. 4,182,156, Cl. 73-35.000.
Dennard, Robert H.; and Rideout, Vincent L., to International Business Machines Corporation. Method of fabricating self-aligned contact vias. 4,182,636, Cl. 148-187.000.
Denninger, Claude; Joly, Michel; and Tabet, Jean-Noel, to Sogemaric. Solid pesticide compositions. 4,182,620, Cl. 71-65.000.
Dennis, Ronald D.: *See—*
Lawson, John E.; and Dennis, Ronald D., 4,182,888, Cl. 546-193.000.
Derschmidt, Hans, to Messerschmitt-Boelkow-Blohm GmbH. Helicopter rotor head. 4,182,597, Cl. 416-134.00A.

Desch, John B., to Comptrol, Inc. Thrust-torque transducer. 4,182,168, Cl. 73-140.000.
Des Marais, Thomas A.; and Hughes, Michael K., to Procter & Gamble Company, The. Preservation of dicarboxylic acid chlorides. 4,182,728, Cl. 260-544.00Y.
Dessau, Ralph M.: *See—*
Heiba, El-Ahmadi I.; and Dessau, Ralph M., 4,182,715, Cl. 260-326.5FL.
de Szegheo, Charles. Drum handling apparatus. 4,182,531, Cl. 294-90.000.
De Thomas, Waldo R.; and Hort, Eugene V., to GAF Corporation. Catalytic hydrogenation of carbonyl containing organic compounds. 4,182,721, Cl. 260-347.800.
Dettmer, Edward V., to Dow Chemical Company, The. Die face cutter. 4,182,605, Cl. 425-311.000.
DeVar Inc.: *See—*
Funk, James B., Jr.; and Linke, Walter R., 4,182,956, Cl. 250-239.000.
DeWolfe, Douglas; Sturley, Richard A.; and McPhilmy, Francis E., to Carrier Corporation. Magnetoresistor bridge probe for locating the position of a magnetic tube support sheet of a nonmagnetic heat exchange conduit. 4,182,985, Cl. 324-220.000.
De Yoreo, Sal G., to Automatic Radio Mfg. Co., Inc. Apparatus for electrically exterminating insects. 4,182,069, Cl. 43-112.000.
Dharia, Dilip J.: *See—*
Baker, Bernard S.; and Dharia, Dilip J., 4,182,795, Cl. 429-13.000.
Diamond, George A.: *See—*
Vas, Ran; Forrester, James S.; and Diamond, George A., 4,182,315, Cl. 128-687.000.
Diana, Guy D., to Sterling Drug Inc. Arylalkyl and aryloxyalkyl phosphonates and use as antiviral agents. 4,182,759, Cl. 424-217.000.
Diana, Guy D.: *See—*
Collins, Joseph C.; and Diana, Guy D., 4,182,727, Cl. 260-465.00F.
Collins, Joseph C.; and Diana, Guy D., 4,182,761, Cl. 424-248.550.
Dickhudt, Eugene A.: *See—*
Bolduc, Lee R.; and Dickhudt, Eugene A., 4,182,328, Cl. 128-235.000.
Dickinson, Thomas; and Dobson, John V., to National Research Development Corporation. Oxygen sensors. 4,182,666, Cl. 204-195.00P.
Dickinson, Thomas: *See—*
Dobson, John V.; and Dickinson, Thomas, 4,182,667, Cl. 204-195.00M.
Dickopp, Gerald; Mahler, Gerhard; and Scholz, Werner, to TED Bildplatten Aktiengesellschaft. Trilinear sequential transmission system for a color television signal, particularly for a recording. 4,183,043, Cl. 358-11.000.
Didier-Werke AG: *See—*
Fehling, Hans R.; and Hase, Horst, 4,182,466, Cl. 222-600.000.
Diel, Hartmut: *See—*
Brauer, Hans; and Diel, Hartmut, 4,182,147, Cl. 72-224.000.
Dieter, Kurt, to Dieter Spezial-Isolierungen GmbH & Co. Spacing element for spacing an inner pipe from an outer pipe. 4,182,378, Cl. 138-112.000.
Dieter Spezial-Isolierungen GmbH & Co.: *See—*
Dieter, Kurt, 4,182,378, Cl. 138-112.000.
Digital Equipment Corporation: *See—*
Anderson, Albert L., 4,183,066, Cl. 360-40.000.
Lawson, Roger E., 4,183,084, Cl. 364-200.000.
Dings, Lloyd M., Jr.: *See—*
Schmucker, William A.; and Dings, Lloyd M., Jr., 4,182,397, Cl. 164-443.000.
Dingwall, Andrew G. F., to RCA Corporation. Inhibitable counter stage and counter. 4,182,961, Cl. 307-225.00C.
Ditgens, Klaus: *See—*
Mues, Volker; Behrenz, Wolfgang; Ditgens, Klaus; and Schmidt, Thomas, 4,182,771, Cl. 424-282.000.
Dixie Bronze Company: *See—*
Phillips, Donald L., 4,182,927, Cl. 13-16.000.
Dobberstein, Hans H.: *See—*
Muller, Wolfgang W.; Dobberstein, Hans H.; and Schroder, Erwin, 4,182,482, Cl. 235-454.000.
Dobson, John V.; and Dickinson, Thomas, to National Research Development Corporation. Ion-sensitive electrodes. 4,182,667, Cl. 204-195.00M.
Dobson, John V.: *See—*
Dickinson, Thomas; and Dobson, John V., 4,182,666, Cl. 204-195.00P.
Dock, Carl G.; and Schrewelius, Nils G., to Bulten-Kanthal AB. Method and means for attaining a predetermined compressive stress. 4,182,189, Cl. 73-761.000.
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., to Mahaska Industries, Inc. Self cleaning animal floor assembly. 4,182,271, Cl. 119-28.000.
Doi, Masafumi: *See—*
Sumitomo, Hiroyuki; Fukami, Katsutoshi; Kobayashi, Kazuyuki; Doi, Masafumi; Kawanishi, Kenzo; and Yoshida, Keido, 4,182,411, Cl. 165-110.000.
Dotson, Ronald L.: *See—*
Lynch, Richard W.; and Dotson, Ronald L., 4,182,661, Cl. 204-78.000.
Douglas, Robert L.; and Jezo, William P., to Giddings & Lewis, Inc. D-C. electric torquing system. 4,182,979, Cl. 318-434.000.
Dow Chemical Company, The: *See—*
Dettmer, Edward V., 4,182,605, Cl. 425-311.000.
Ezzell, Bobby R., 4,182,849, Cl. 528-392.000.
Garner, Joseph L.; and Wittbrodt, Edwin L., 4,182,259, Cl. 118-712.000.
Giles, James H.; Stultz, Jeffery H.; and Jones, Sandra W., 4,182,920, Cl. 568-895.000.
Goldberger, William M.; Parekh, Bhupendra K.; and Faulkner, Bobby P., 4,182,498, Cl. 241-24.000.
Marshall, Cary S.; and Steffanson, Robert S., 4,182,850, Cl. 528-480.000.
McDonald, Charles J.; Van Landingham, John V.; and Givens, Steven P., 4,182,417, Cl. 166-295.000.
Smith, William L.; and Lalk, Robert H., 4,182,794, Cl. 428-537.000.
Tung, Lu H.; and Lo, Grace Y-S., 4,182,818, Cl. 526-173.000.
Drackett Company, The: *See—*
Maust, Daniel C.; and Jones, David A., 4,181,999, Cl. 15-119.00A.
Murtaugh, Justin J., 4,182,688, Cl. 252-305.000.
O'Dwyer, Michael F.; Feroce, John J.; and Jones, David A., 4,182,577, Cl. 403-74.000.
Dresser Industries, Inc.: *See—*
Cason, George A., Jr., 4,182,394, Cl. 164-4.000.
Youngblood, Thomas F.; Saxman, William C.; and Wilemon, Gerald F., 4,182,422, Cl. 175-53.000.
Drew, William D.; Foster, Leslie D.; and Gallant, Dennis J., to Hill-Rom Company, Inc. Side guard for bed including means for controlling remote electrical devices. 4,183,015, Cl. 340-286.00R.
Driscoll, John J.; and Gold, Nicholas, to Polaroid Corporation. Exposure identification accessory. 4,182,559, Cl. 354-105.000.
Driscoll, Patrick R., to Mobil Oil Corporation. 5-Substituted thiadiazole ureas. 4,182,712, Cl. 548-140.000.
Drury, Marcus D. Continuously variable mechanical transmission. 4,182,203, Cl. 74-834.000.
Druzhkova, Larisa M.: *See—*
Sinelnikov, Alexandr V.; Patushinskaya, Raisa S.; Freidgeim, Lazar I.; Bizev, Anatoly A.; Druzhkova, Larisa M.; Salimov, Vyacheslav K.; Lebedich, Sergei P.; Lvov, Sergei L.; Minkina, Margarita E.; Shurygin, Alexandr P.; Levin, Valery S.; Faradzh-Zade, Solmaz A.; Lebedev, Igor V., deceased; and Lebedeva, Marina I., administrator, 4,182,358, Cl. 137-115.000.
D'Silva, Thomas L., to GTE Sylvania Products, Inc. Partially amorphous silver-copper-indium brazing foil. 4,182,628, Cl. 75-153.000.
Dual Light Inc.: *See—*
Smith, Terry L., 4,182,569, Cl. 355-84.000.
Duchet, Michel: *See—*
Courrier, Gilbert; Duchet, Michel; Leblanc, Michele; and Moirez, Jacques, 4,182,570, Cl. 356-28.000.
Du Pont de Nemours, E. I., and Company: *See—*
Bartlett, Philip L., 4,182,687, Cl. 252-194.000.
Briggs, Paul C., Jr.; and Muschiatti, Lawrence C., 4,182,644, Cl. 156-310.000.
Cherkofsky, Saul C.; and Sharpe, Thomas R., 4,182,769, Cl. 424-273.00R.
Lauder, Alan, 4,182,694, Cl. 252-462.000.
Middleton, William J., 4,182,760, Cl. 424-244.000.
Duquesne Systems, Inc.: *See—*
Chatfield, Glen F., 4,183,083, Cl. 364-200.000.
Durand, Francois; and Guillem, Christian, to Institute de Recherches et d'Etudes de Techniques Specifiques. Motorized delivery tricycle. 4,182,521, Cl. 280-202.000.
Dutcher, Daniel P., to Champion International Corporation. Method of installing plastic window in a box cover. 4,182,224, Cl. 93-39.00R.
Dworak, Wilhelm; Muller, Karl-Heinz; and Talmon, Wolfgang, to Robert Bosch GmbH. Leakage prevention means for a positive displacing machine. 4,182,602, Cl. 418-132.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Franzmann, Giselher; and Hulsmann, Hans-Leo, 4,182,904, Cl. 562-401.000.
Schmidt, Hans-Georg; Daum, Gerhard; and Vogt, Wilhelm, 4,182,910, Cl. 568-595.000.
Dynapol: *See—*
Bunes, Leonard A., 4,182,885, Cl. 546-76.000.
E. Green & Son Ltd.: *See—*
Gibson, Thomas, 4,182,275, Cl. 122-7.00R.
E M I Limited: *See—*
Davis, Gordon P., 4,182,955, Cl. 250-402.000.
E-Systems, Inc.: *See—*
Bernhard, Frank L., 4,182,504, Cl. 248-49.000.
Earle, Michael; and Lenzen, Glenn H., to Caterpillar Tractor Co. Engine valve. 4,182,299, Cl. 123-188.00R.
Eastman Kodak Company: *See—*
Irick, Gether, Jr.; Ownby, James C.; and Wang, Richard H. S., 4,182,703, Cl. 260-45.8RW.
Jackson, Winston J.; and Kuhfuss, Herbert F., 4,182,842, Cl. 528-292.000.
Moeller, Charles R., 4,182,987, Cl. 324-249.000.
O'Reagan, James R., 4,182,566, Cl. 354-268.000.
Rhody, Harvey E.; Metildi, Frederic H.; and Granger, Edward M., 4,183,065, Cl. 360-9.000.
Eaton Corporation: *See—*
Butterworth, Edmund M., 4,182,943, Cl. 200-159.00R.
Ecolotrol, Inc.: *See—*
Jeris, John S., 4,182,675, Cl. 210-8.000.
Egan Machinery Company: *See—*
Knittel, Richard R., 4,182,603, Cl. 425-133.100.
Egoricheva, Sofya A.: *See—*
Borgardt, Valentina J.; Volodin, Jury I.; Shalimova, Zoya S.; Pantukh, Boris T.; Egoricheva, Sofya A.; Rutman, Grigory I.; and Michurov, Jury I., 4,182,921, Cl. 568-750.000.

Ehrenspeck, Hermann W. Dual frequency band directional antenna system. 4,183,027, Cl. 343-726.000.
Eisen und Drahtwerk Erlau Aktiengesellschaft: *See*—
Muller, Anton, 4,182,392, Cl. 152-219.000.
Electroheating (London) Limited: *See*—
Brooks, David S.; and Savage, Trevor C., 4,183,001, Cl. 336-62.000.
Electronique Marcel Dassault: *See*—
Baudard, Thierry; Schumperli, Max; and Pouzet, Alain, 4,183,022, Cl. 343-6.80R.
Elf Union: *See*—
Fayard, Jean-Claude, 4,182,296, Cl. 123-122.00A.
Elliott Brothers (London) Limited: *See*—
Proctor, Ronald K., 4,182,174, Cl. 73-212.000.
Wickenden, Dennis K., 4,182,025, Cl. 29-577.00R.
Ellis, Ronald M., to Firestone Tire & Rubber Company, The. Heat stabilized polyvinyl chloride dispersion resins. 4,182,698, Cl. 260-23.0XA.
Ellman, Allen; and Garito, Jon. Honing stone attachment for dental handpiece. 4,182,037, Cl. 433-110.000.
Elson, Jesse M. Method and structure for insulating a wall or ceiling. 4,182,085, Cl. 52-2.000.
Eltera Kunstoff-Technik GmbH: *See*—
Haupt, Gunter; Fischer, Franz; and Handtmann, Arthur, 4,182,843, Cl. 528-326.000.
Emerson Electric Co.: *See*—
Markum, Thomas R.; and Bryson, Charles E., Jr., 4,182,948, Cl. 219-541.000.
Emmenthal, Klaus-Dieter, to Volkswagenwerk Aktiengesellschaft. Apparatus for injecting fuel into a multi-cylinder internal combustion engine having a supercharging compressor. 4,182,294, Cl. 123-119.00C.
Emmett, William J.: *See*—
Stewart, Alan G.; Whiteford, John; and Emmett, William J., 4,182,245, Cl. 110-101.0CF.
Endo, Hiroshi; and Baba, Kosaku, to Nissan Motor Company, Inc. System for establishing a communication link between a ground station and each of vehicle drivers within a limited communication area. 4,182,989, Cl. 325-53.000.
Endo, Masayuki: *See*—
Makino, Kenya; Komatsu, Koei; Takeuchi, Yasumasa; and Endo, Masayuki, 4,182,813, Cl. 526-92.000.
Endriz, John G.: *See*—
Catanese, Carmen A.; and Endriz, John G., 4,182,969, Cl. 313-105.00R.
Keneman, Scott A.; and Endriz, John G., 4,182,968, Cl. 313-105.00R.
Energy Development Associates, Inc.: *See*—
Hart, Thomas G., 4,182,662, Cl. 204-101.000.
Energy Research Corporation: *See*—
Baker, Bernard S.; and Dharia, Dilip J., 4,182,795, Cl. 429-13.000.
Engeler, William E.: *See*—
Papadofrangakis, Emmanuel; Fakiris, John A.; and Engeler, William E., 4,182,173, Cl. 73-194.00A.
Engineered Sports Products, Inc.: *See*—
Dalebout, Melvin W., 4,182,056, Cl. 36-117.000.
English, J. Richard. Display frame. 4,182,061, Cl. 40-152.100.
Engquist, Karl R.: *See*—
Stratton, Michael K.; Engquist, Karl R.; Keske, Frank E.; Powers, Harold C.; and Sparks, James D., 4,182,122, Cl. 60-322.000.
Enomoto, Hiroshi: *See*—
Murai, Hiromu; Enomoto, Hiroshi; Aoyagi, Yoshiaki; Yoshikuni, Yoshiaki; Yagi, Masahiro; and Shirahase, Ichiro, 4,182,767, Cl. 424-267.000.
Entreprise d'Equipements Hydrauliqes E.M.H.: *See*—
Guillaume, Daniel; and Tuson, Samuel, 4,182,389, Cl. 141-387.000.
Envirotech Corporation: *See*—
Lombana, Luis A.; and Campos, Jose G., 4,182,246, Cl. 110-188.000.
Epstein, James; and Marincic, Nikola, to GTE Laboratories Inc. Hermetically sealed button-type electrochemical cell and method for making same. 4,182,028, Cl. 29-623.200.
Erhardt, Siegfried, to Robugen GmbH Pharmaceutische Fabrik. Process for the preparation of 2'-deoxyribofuranosyl nucleosides. 4,182,859, Cl. 536-23.000.
Eriksson, Lennart O. R., to Teknoterm Systems AB. Apparatus having a temperature sensitive element for controlling a damper in a ventilation system. 4,182,487, Cl. 236-49.000.
Erno Raumfahrttechnik GmbH: *See*—
Rolf, ckhard, 4,182,257, Cl. 114-333.000.
Ernst, Alfred. Durometer. 4,182,162, Cl. 73-81.000.
Ernst Leitz Wetzlar GmbH: *See*—
Hengst, Alfred, 4,183,075, Cl. 362-6.000.
Ernst Winter & Sohn (GmbH & Co.): *See*—
Meyer, Hans-Robert, 4,182,082, Cl. 51-5.00D.
Erth, Richard A., to Borg-Warner Corporation. Liquid cooling system for hermetically sealed electric motor. 4,182,137, Cl. 62-505.000.
Esaki, Shingo: *See*—
Mibu, Hiroaki; Ishihara, Tadashi; Tanaka, Chiaki; and Esaki, Shingo, 4,182,665, Cl. 204-159.150.
Esch, Erich: *See*—
Schmidt, Manfred; Freitag, Dieter; Fries, Hermann; and Esch, Erich, 4,182,697, Cl. 260-19.00R.
Esposito, Roberto: *See*—
Francese, Renato; and Esposito, Roberto, 4,182,875, Cl. 544-204.000.
Ester Williams Swimming Pools: *See*—
Schall, Frederick R.; and Kessler, Frank L., 4,182,087, Cl. 52-169.700.
Etes, Donald E., to North American Laboratories, Inc. Disposable emesis container. 4,182,478, Cl. 229-62.000.
Ethicon, Inc.: *See*—
Huck, Charles M.; Ashley, Charles R.; Williams, Ina L.; and Mandel, Harvey B., 4,182,448, Cl. 206-380.000.
Ethyl Corporation: *See*—
Niebylski, Leonard M., 4,182,120, Cl. 60-274.000.
Ethyl Products Company: *See*—
Burke, James E., 4,182,496, Cl. 239-492.000.
Eto, Fumio: *See*—
Konishi, Kazunori; Wakayama, Hiromu; Nagatani, Toshihiro; and Eto, Fumio, 4,182,042, Cl. 33-18.00R.
Evans, Graham: *See*—
Kitzing, Rainer; Scott, John G. V.; Webb, Terence C.; and Evans, Graham, 4,182,886, Cl. 546-304.000.
Evans, James D.; and Pool, Sam L., to Kewp Electronic Systems, Inc. Apparatus and method for monitoring sports contests. 4,183,056, Cl. 358-108.000.
Evans, Thomas A.: *See*—
Chevali, Harihar D.; and Evans, Thomas A., 4,182,608, Cl. 431-359.000.
Evans, Thomas S.: *See*—
Laks, Sid; and Evans, Thomas S., 4,182,686, Cl. 252-119.000.
Everson, Benjamin A.; and Klotzbier, Kenneth D., to Underground Surveys Corporation. Apparatus for impregnating a tube. 4,182,262, Cl. 118-44.000.
Ewald, Jerome T., to Bendix Corporation, The. Control mechanism for an integrated brake and steering system. 4,182,427, Cl. 180-148.000.
Exley, John T.; and Kuintzle, Charles, to Avco Corporation. Diffuser vane cusp bleed aperture with automatic ejector control device. 4,182,117, Cl. 60-39.070.
Exxon Research & Engineering Co.: *See*—
Floyd, Joseph C.; and Plank, Don A., 4,182,725, Cl. 260-45.85S.
Gladrow, Elroy M., 4,182,693, Cl. 252-455.00Z.
Stover, William H.; and Hunter, Samuel A., 4,182,613, Cl. 44-51.000.
Eyelet Specialty Co., Inc.: *See*—
McArdle, James M.; and Klimeck, Edward F., 4,182,945, Cl. 206-385.000.
Eyrick, Theodore B.; Brown, Allen C.; and Hattes, Neil R., to Chemetron Corporation. Volume-rate respirator system and method. 4,182,599, Cl. 417-328.000.
Ezzell, Bobby R., to Dow Chemical Company, The. Copolymers made from divinyl aromatic compounds and alkylene polyamines. 4,182,849, Cl. 528-392.000.
Fabri-Tek Incorporated: *See*—
Sutich, Edward R., 4,183,092, Cl. 365-51.000.
Fage, Etienne, to Astech. Thrust reverser for jet engine forming active extension of jet tube. 4,182,501, Cl. 244-110.00B.
Fairbairn, Hugh E. Scraper attachment for oscillating vibrator sanders. 4,182,000, Cl. 15-236.00B.
Fairchild Camera and Instrument Corporation: *See*—
Molloy, Len; and Schneider, Mark R., 4,182,020, Cl. 29-469.500.
Fakiris, John A.: *See*—
Papadofrangakis, Emmanuel; Fakiris, John A.; and Engeler, William E., 4,182,173, Cl. 73-194.00A.
Fan, You-Ling, to Union Carbide Corporation. Aqueous microemulsions of vinyl resins having carboxylic or sulfonic groups. 4,182,699, Cl. 260-29.6PM.
Fannin, Richard C., to Bendix Corporation, The. Trailer brake system. 4,182,535, Cl. 303-9.000.
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Farag, Farouk: *See*—
Morgan, Charles W.; Robinson, Dale; and Farag, Farouk, 4,181,991, Cl. 5-400.000.
Faulkner, Bobby P.: *See*—
Goldberger, William M.; Parekh, Bhupendra K.; and Faulkner, Bobby P., 4,182,498, Cl. 241-24.000.
Favara, Duccio; and Guzzi, Umberto, to Gruppo Lepetit S.p.A. 13-Azaprostaglandins. 4,182,903, Cl. 562-503.000.
Fayard, Jean-Claude, to Elf Union. Apparatus permitting an improvement of the carburetion of internal combustion engines. 4,182,296, Cl. 123-122.00A.
Feaster, Donavon L., to Sonitronics, Inc. Miniature switches. 4,182,939, Cl. 200-17.00R.
Fedison, Walter W., Jr.: *See*—
Scussel, August J.; Fedison, Walter W., Jr.; and Michie, Donald R., 4,182,940, Cl. 200-19.00R.
Fedorov, Viktor V.: *See*—
Bocharov, Jury N.; Kabanov, Viktor A.; Martynova, Marina A.; Popov, Valery G.; Smetanjuk, Vladimir I.; and Fedorov, Viktor V., 4,182,811, Cl. 526-69.000.
Fehling, Hans R.; and Hase, Horst, to Didier-Werke AG. Wear part for sliding gates and process for the production of such wear parts and sliding gate with such wear parts. 4,182,466, Cl. 222-600.000.
Feinbloom, William. Side view mirror employing prism for blind spot correction. 4,182,552, Cl. 350-303.000.

Feins, Irvin R.: *See*—
Rainer, Norman B.; and Feins, Irvin R., 4,182,743, Cl. 422-211.000.
Fendel, Kurt: *See*—
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Fernandez, Joseph L.: *See*—
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Fernandez, Marlin D.: *See*—
Haber, Terry M.; and Fernandez, Marlin D., 4,182,737, Cl. 264-135.000.
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O'Dwyer, Michael F.; Feroce, John J.; and Jones, David A., 4,182,577, Cl. 403-74.000.
Ferreira, Richard A.; and Brito, Manuel J. Gutter cleaning device. 4,182,497, Cl. 239-532.000.
Ferrero OHG: *See*—
Holtorf, Erhard, 4,182,241, Cl. 101-405.000.
Ferro Corporation: *See*—
Roberts, Gordon J.; and Heasley, James H., 4,182,437, Cl. 188-251.00A.
Searight, Charles E.; and Heasley, James E., 4,182,548, Cl. 350-103.000.
Fiat-Allis Construction Machinery, Inc.: *See*—
Beveridge, Paul J.; and Vigesaa, Myron L., 4,182,404, Cl. 165-41.000.
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Gibbon, John D., 4,182,606, Cl. 425-461.000.
Fields, Ellis K.; Cerefice, Steven A.; and Paschke, Edward E., to Standard Oil Company (Indiana). Monomers for poly(methylenebenzoate) polymers from toluic acid compounds. 4,182,847, Cl. 528-361.000.
Fink, Richard E. Soil percolation testing apparatus. 4,182,157, Cl. 73-38.000.
Finke, Harry P.: *See*—
Hovis, James E.; Finke, Harry P.; and Leumann, Hans E., 4,182,609, Cl. 432-234.000.
Firestone Tire & Rubber Company, The: *See*—
Ellis, Ronald M., 4,182,698, Cl. 260-23.0XA.
Hergenrother, William L.; and Halasa, Adel F., 4,182,834, Cl. 528-168.000.
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Hergenrother, William L.; and Halasa, Adel F., 4,182,836, Cl. 528-168.000.
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Firmaframe Nominees Proprietary Ltd.: *See*—
Leivenzon, Simon; and Leivenzon, Steven, 4,182,144, Cl. 70-100.000.
Fischer, Albert G. Pulsed nuclear fusion reactor. 4,182,650, Cl. 176-8.000.
Fischer, Albert G. Pulsed deuterium lithium nuclear reactor. 4,182,651, Cl. 176-8.000.
Fischer, Artur. Mounting arrangement. 4,182,091, Cl. 52-508.000.
Fischer, Franz: *See*—
Haupt, Gunter; Fischer, Franz; and Handtmann, Arthur, 4,182,843, Cl. 528-326.000.
Fischer & Porter Company: *See*—
Baird, James D., 4,183,007, Cl. 367-119.000.
Fisher, Charles B.; and Fisher, Sidney T. A-m stereo system. 4,182,932, Cl. 179-1.0GS.
Fisher, Eugene W., to General Steel & Supply Co. Heated conveyor belt scraper. 4,182,444, Cl. 198-499.000.
Fisher, Sidney T.: *See*—
Fisher, Charles B.; and Fisher, Sidney T., 4,182,932, Cl. 179-1.0GS.
Fisons Limited: *See*—
Baskeyfield, Lewis J.; Bell, John D.; Townend, John; and Pollock, Simon D. A., 4,182,916, Cl. 568-734.000.
Fitts, Martin E., to Core-Lock Foam, Inc. Method of forming lamina and block laminates. 4,182,641, Cl. 156-77.000.
Fleck, Fritz; Balzer, Hans; and Aebli, Horst, to Sandoz Ltd. Fluorescent 1,2,3-triazole derivatives of 3-phenylcoumarin. 4,182,861, Cl. 542-441.000.
Fleer, Ernst O., to Siemens Aktiengesellschaft. Dental handpiece. 4,182,038, Cl. 433-85.000.
Fleming, Thomas W.: *See*—
Cenker, Ronald P.; Fleming, Thomas W.; and Huff, Frank R., 4,183,096, Cl. 365-222.000.
Floyd, Joseph C.; and Plank, Don A., to Exxon Research & Engineering Co. Novel bisphenol derivatives and uses thereof. 4,182,725, Cl. 260-45.85S.
Flynn, Dennis E. Entertainment and/or educational device. 4,182,051, Cl. 35-9.00E.
FMC Corporation: *See*—
Hurliman, Russell J.; and Scribner, Frank F., 4,182,420, Cl. 171-38.000.
Mayhew, Roger D.; and Chalmers, Richard J., 4,182,201, Cl. 74-713.000.
Fohey, Donald R., to K. J. Law Engineers, Inc. Penetration hardness tester with digital readout. 4,182,164, Cl. 73-83.000.
Foley, James W., to Polaroid Corporation. Synthesis of 5-bromopyrogallol 1,3-dimethyl ether. 4,182,912, Cl. 568-649.000.
Ford, Ernest C., Jr., to ICI Americas Inc. Vinyl ester urethanes. 4,182,830, Cl. 528-75.000.
Ford, Mark W.; and Wearden, Thomas B., to Lee Green Precision Industries Ltd. Method and apparatus for terminating optical fibres. 4,182,017, Cl. 29-428.000.
Ford Motor Company: *See*—
Scussel, August J.; Fedison, Walter W., Jr.; and Michie, Donald R., 4,182,940, Cl. 200-19.00R.
Formax, Inc.: *See*—
Lamartino, Salvatore P.; Richards, Louis R.; and Sandberg, Glenn A., 4,182,003, Cl. 17-32.000.
Forrester, James S.: *See*—
Vas, Ran; Forrester, James S.; and Diamond, George A., 4,182,315, Cl. 128-687.000.
Forsheda Gummifabrik AB: *See*—
Nilsson, Bernt, 4,182,376, Cl. 137-874.000.
Forster, Brian M., to GKN Transmissions Limited. Display device for rotary balancing machines. 4,182,185, Cl. 73-462.000.
Forster, Manfred; and Geidis, Ulrich, to Krupp-Koppers GmbH. Process for determining the fuel flow into the gasifier of a partial oxidation installation for solid, fine-grain or dust-like fuels. 4,182,957, Cl. 250-356.000.
Fortuin, Michael S.: *See*—
Caunt, Anthony D.; Fortuin, Michael S.; and Williams, Ian G., 4,182,816, Cl. 526-119.000.
Fortuna-Werke Maschinenfabrik GmbH: *See*—
Gruber, Ernst, 4,181,994, Cl. 12-1.00A.
Foster, Leslie D.: *See*—
Drew, William D.; Foster, Leslie D.; and Gallant, Dennis J., 4,183,015, Cl. 340-286.00R.
Foster, Stephen W., to Almor Corporation. Convertible single-double belt check-out counter. 4,182,433, Cl. 186-1.0AA.
Fourcher, Frederick J. Abalone habitat. 4,182,270, Cl. 119-4.000.
Fowler, Kenneth A., to Panametrics, Inc. Method and apparatus for zero point calibration of ultrasonic thickness gauge. 4,182,155, Cl. 73-1.0DV.
Fozzard, George B.; and Norell, John R., to Phillips Petroleum Company. Diacyloxybutene isomerization with selenium dioxide. 4,182,901, Cl. 560-262.000.
Francese, Renato; and Esposito, Roberto, to Rumianca S.p.A. Production of chloro-bis(alkylamino)-s-triazines. 4,182,875, Cl. 544-204.000.
Francese, Renato: *See*—
Baldi, Luciano; Giorcelli, Giuliano; and Francese, Renato, 4,182,874, Cl. 544-204.000.
Frankland, Roger A.; and Franklin, Henry E., to Beckman Instruments, Inc. Method of sealing gas discharge displays. 4,182,540, Cl. 316-19.000.
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Frankland, Roger A.; and Franklin, Henry E., 4,182,540, Cl. 316-19.000.
Franzmann, Giselher; and Hulsmann, Hans-Leo, to Dynamit Nobel Aktiengesellschaft. Method of racemizing optically active N-acyl amino acids in aqueous solution. 4,182,904, Cl. 562-401.000.
Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. 4-Carbobenzoxypiperazine-2-carboxylic acid chemical intermediate. 4,182,869, Cl. 544-388.000.
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Freidgeim, Lazar I.: *See*—
Sinelnikov, Alexandr V.; Patushinskaya, Raisa S.; Freidgeim, Lazar I.; Bizev, Anatoly A.; Druzhkova, Larisa M.; Salimov, Vyacheslav K.; Lebedich, Sergei P.; Lvov, Sergei L.; Minkina, Margarita E.; Shurygin, Alexandr P.; Levin, Valery S.; Faradzh-Zade, Solmaz A.; Lebedev, Igor V., deceased; and Lebedeva, Marina I., administrator, 4,182,358, Cl. 137-115.000.
Freitag, Dieter: *See*—
Schmidt, Manfred; Freitag, Dieter; Fries, Hermann; and Esch, Erich, 4,182,697, Cl. 260-19.00R.
Freund, Donald F., to Mead Corporation, The. Drum closure assembly. 4,182,475, Cl. 229-5.700.
Friedenberg, Richard C. Blade sharpener. 4,182,084, Cl. 51-214.000.
Friedrich Kocks GmbH & Company: *See*—
Brauer, Hans; and Diel, Hartmut, 4,182,147, Cl. 72-224.000.
Friel, Teresa L.: *See*—
Hong, Paul O.; Petrillo, James R.; Friel, Teresa L.; and Witenhafer, Donald E., 4,182,809, Cl. 526-62.000.
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Youval, Anat; Frommer, Moshe A.; Movshovich, Shmuel; and Cojocaro, Adriana, 4,182,582, Cl. 405-45.000.
Fry, John S., to Union Carbide Corporation. Thermosetting phenolic resin coating and adhesive compositions. 4,182,732, Cl. 260-826.000.
Fuji Electric Co., Ltd.: *See*—
Ueda, Tsuneo, 4,182,123, Cl. 60-325.000.
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Yagi, Shizuo; Fujii, Isao; and Nishikawa, Masayasu, 4,182,285, Cl. 123-75.00B.
Yagi, Shizuo; Fujii, Isao; and Tanaka, Atsushi, 4,182,286, Cl. 123-75.00B.
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Fujii, Setsuro; Kawamura, Hiroyuki; Taira, Seizo; Matsui, Ryoji; Sakurai, Yojiro; and Okutome, Toshiyuki, to Torii & Co., Ltd. Amino- or

guanidino-phenylpropionic acid derivatives. 4,182,897, Cl. 560-19.000.

Fujimori, Kazuyoshi; and Mitsuishi, Akio, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Ink-ribbon reversing device. 4,182,576, Cl. 400-221.000.

Fujisada, Hiroyuki: *See—*
Kataoka, Shoei; Tateno, Hiroshi; Fujisada, Hiroyuki; Yamada, Hideo; Kawashima, Mitsuo; and Komamiya, Yasuo, 4,182,964, Cl. 307-299.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Kamiya, Takashi; Hashimoto, Masashi; Hemmi, Keiji; and Takeno, Hidekazu, 4,182,758, Cl. 424-211.000.

Fujisoku Electric Co., Ltd.: *See—*
Sano, Minoru, 4,182,944, Cl. 200-315.000.

Fujita, Motoyoshi, to TDK Electronics Co., Ltd. Electromagnet for degaussing record-reproduce heads. 4,183,070, Cl. 360-128.000.

Fujiwara, Edward J.; and Pate, Michelle D., to Anderson Development Company. Stable and storable polyester-polyether co-prepolymers. 4,182,898, Cl. 560-26.000.

Fujiwara, Yasuo: *See—*
Takezono, Tetsuya; and Fujiwara, Yasuo, 4,182,913, Cl. 568-697.000.
Yagi, Osami; and Fujiwara, Yasuo, 4,182,765, Cl. 424-263.000.

Fukai, Masakazu: *See—*
Kondo, Shigeo; Yoshiike, Nobuyuki; and Fukai, Masakazu, 4,182,797, Cl. 429-191.000.

Fukami, Katsutoshi: *See—*
Sumitomo, Hiroyuki; Fukami, Katsutoshi; Kobayashi, Kazuyuki; Doi, Masafumi; Kawanishi, Kenzo; and Yoshida, Keido, 4,182,411, Cl. 165-110.000.

Fukano, Yoshihiro; and Oneyama, Naotake, to Shoketsu Kinzoku Kogyo Kabushiki Kaisha. Spool-sleeve type change-over valve. 4,182,375, Cl. 137-625.690.

Fukazawa, Takao: *See—*
Isayama, Takuro; and Fukazawa, Takao, 4,183,029, Cl. 346-140.00R.

Fukuda, Shigeho: *See—*
Takano, Hideo; Shimohori, Yukio; and Fukuda, Shigeho, 4,182,734, Cl. 264-40.500.

Fukuhara, Toshio: *See—*
Ogata, Yuzuru; Fukuhara, Toshio; and Araki, Shigeru, 4,182,621, Cl. 71-76.000.

Fukumi, Hirokazu: *See—*
Kominami, Naoya; Fukumi, Hirokazu; Yamawaki, Naokuni; Nomura, Junji; and Kayamori, Hiroshi, 4,182,267, Cl. 119-3.000.

Fuller, Mark W. Liquid level controller. 4,182,363, Cl. 137-392.000.

Fulmer, Keith H., to Bendix Corporation, The. Push rod assembly. 4,182,220, Cl. 91-217.000.

Funk, Gerhard; Weller, Eberhard; Renovanz, Hans-Dietrich; and Papendick, Uwe, to Boehringer Ingelheim GmbH. Thermistor circuit. 4,182,183, Cl. 73-362.0AR.

Funk, James B., Jr.; and Linke, Walter R., to DeVar Inc. Optical light pen. 4,182,956, Cl. 250-239.000.

Furukawa, Kazuo; Masuda, Takeshi; Nunotani, Masakatu; and Amano, Norio, to Hitachi, Ltd. Magnetic bubble memory equipment. 4,183,090, Cl. 364-900.000.

Furuta, Naofumi; and Saito, Hisatoshi, to Kewpie Kabushiki Kaisha. Egg inspecting apparatus. 4,182,571, Cl. 356-53.000.

Furuyama, Yukihiro: *See—*
Moriyama, Noboru; Aoki, Yoshio; and Furuyama, Yukihiro, 4,182,614, Cl. 44-51.000.

Fussell, Edsel M.: *See—*
Parke, James G.; Norman, Richard O.; Colle, Edward D.; and Fussell, Edsel M., 4,182,491, Cl. 239-11.000.

G. D. Searle & Co., Limited: *See—*
Benson, Gerald B., 4,182,344, Cl. 128-351.000.

G. V. Planer Limited: *See—*
Green, Malcolm L. H.; and Norgate, Peter, 4,182,742, Cl. 422-199.000.
Green, Malcolm L. H.; and Hammond, Vivian J., 4,182,749, Cl. 423-659.000.

Gadbois, Richard T.; and Matthews, Richard A., to Minnesota Mining and Manufacturing Company. Method of making a rotatable floor treating pad. 4,182,616, Cl. 51-295.000.

Gaeddert, Melvin V.; and McWhirt, Bobby D., to Hesston Corporation. Machine for coiling fibrous crop materials into large round bales. 4,182,101, Cl. 56-341.000.

GAF Corporation: *See—*
De Thomas, Waldo R.; and Hort, Eugene V., 4,182,721, Cl. 260-347.800.

Gagnebin, Pierre-Luc, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Time-piece with electric motor driven display and planetary motion work. 4,182,114, Cl. 58-59.000.

Galaini, James L.; and Kindred, Scott G. Burglar alarm foil block. 4,182,541, Cl. 339-125.00R.

Gallant, Dennis J.: *See—*
Drew, William D.; Foster, Leslie D.; and Gallant, Dennis J., 4,183,015, Cl. 340-286.00R.

Gardner, James H., to Oros Company. Underground pumped liquid energy storage system and method. 4,182,128, Cl. 60-652.000.

Garito, Jon: *See—*
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Garner, Joseph L.; and Wittbrodt, Edwin L., to Dow Chemical Company, The. Apparatus for measuring coating thickness on an applicator roll. 4,182,259, Cl. 118-712.000.

Garrett, William R., to Smith International, Inc. Reamer. 4,182,425, Cl. 175-228.000.

Gatellier, Claude: *See—*
Bocard, Christian; Renault, Philippe; Seris, Henri; and Gatellier, Claude, 4,182,677, Cl. 210-36.000.

Gay, Derek J.; Wilson, Nicol S.; Sweet, Roger H.; and Berford, Saint E. B., to Mattel, Inc. Animated doll. 4,182,076, Cl. 46-265.000.

Gebhardt, James L.: *See—*
Hutchins, Ferris L., Jr.; and Gebhardt, James L., 4,182,244, Cl. 108-91.000.

Geidis, Ulrich: *See—*
Forster, Manfred; and Geidis, Ulrich, 4,182,957, Cl. 250-356.000.

Geils, Ronald H.: *See—*
Keezer, Richard C.; and Geils, Ronald H., 4,183,094, Cl. 365-127.000.

Gemmill, Robert M., Jr.: *See—*
Schick, John W.; and Gemmill, Robert M., Jr., 4,182,922, Cl. 585-18.000.

General Atomic Company: *See—*
Hurley, George L., III; and Krystek, Michael S., 4,182,953, Cl. 250-231.0SE.
Kissinger, John A., 4,182,413, Cl. 165-163.000.

General Electric Company: *See—*
Adomitis, John T.; and Larson, Richard I., 4,182,383, Cl. 141-5.000.
Chevali, Harihar D.; and Evans, Thomas A., 4,182,608, Cl. 431-359.000.
Cleveland, Lewis C.; and Smith, Howard W., 4,183,003, Cl. 337-156.000.
Collins, Edward J.; and Sterling, Vaughn C., 4,182,607, Cl. 431-359.000.
Cutler, John H.; and Walker, Loren H., 4,183,081, Cl. 363-81.000.
Goossens, John C.; and Molari, Richard E., Jr., 4,182,787, Cl. 428-36.000.
Kim, Seung K.; and Shouse, John F., Jr., 4,183,047, Cl. 358-27.000.
Kruh, Daniel, 4,182,853, Cl. 528-503.000.
Lemmond, Charles Q., 4,182,010, Cl. 29-25.180.
Mark, Victor; and Hedges, Charles V., 4,182,838, Cl. 528-202.000.
Papadofrangakis, Emmanuel; Fakiris, John A.; and Engeler, William E., 4,182,173, Cl. 73-194.00A.
Putz, John M., 4,182,970, Cl. 313-113.000.
Russell, Ronald R., 4,183,071, Cl. 361-59.000.

General Engineering Co. (Radcliffe) Limited, The: *See—*
Hill, Alan H., 4,182,601, Cl. 425-97.000.

General Foods Corporation: *See—*
Hall, Harlan S.; and Pondell, Ralph E., 4,182,778, Cl. 426-72.000.

General Motors Corporation: *See—*
Buchanan, Harry C., Jr.; and Hussey, James L., 4,183,026, Cl. 343-715.000.

General Steel & Supply Co.: *See—*
Fisher, Eugene W., 4,182,444, Cl. 198-499.000.

Genesco, Inc.: *See—*
Turner, Newton C., Jr., 4,182,055, Cl. 36-30.00R.

Gerstner, Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit arrangement. 4,183,021, Cl. 340-753.000.

Gibbon, John D., to Fiber Industries, Inc. Slit extrusion die. 4,182,606, Cl. 425-461.000.

Gibbons, Michael P.: *See—*
Ziebarth, Timothy D.; Hauser, Ray L.; Thompson, James R.; Harris, John F.; Gibbons, Michael P.; and Burton, Guy C., 4,182,423, Cl. 175-61.000.

Gibson, James D. M.; Houlbrook, Kenneth; and Coulter, John P., to I.W.S. Nominee Company Limited. Apparatus for applying a crease retaining coating in a preformed crease. 4,182,264, Cl. 118-306.000.

Gibson, Thomas, to E. Green & Son Ltd. Boilers. 4,182,275, Cl. 122-7.00R.

Giddings & Lewis, Inc.: *See—*
Douglas, Robert L.; and Jezo, William P., 4,182,979, Cl. 318-434.000.

Gieseke, James A.: *See—*
Schmidt, Eric W.; Miga, Lawrence W.; and Gieseke, James A., 4,182,673, Cl. 209-45.000.

Gilain, Jacques: *See—*
Vanlautem, Noel; Mulders, Julien; and Gilain, Jacques, 4,182,807, Cl. 525-387.000.

Gilbert, Marvin E.: *See—*
Sanders, Larry D.; and Gilbert, Marvin E., 4,182,414, Cl. 166-74.000.

Gilbert, Russell T.; and Antunez, Armand E., Jr., to Coast Foundry & Mfg. Co. Adjustable ball cock riser. 4,182,364, Cl. 137-426.000.

Giles, James H.; Stultz, Jeffery H.; and Jones, Sandra W., to Dow Chemical Company, The. Process for hydration of olefins to produce alcohols. 4,182,920, Cl. 568-895.000.

Giles, Richard F., to Phillips Petroleum Company. Method and apparatus for measuring material properties related to radiation attenuation. 4,182,954, Cl. 250-308.000.

Gill, Douglas C. Sailboat racing game. 4,182,516, Cl. 273-258.000.

Gillett, Kenneth: *See—*
Daughton, John W.; Gillett, Kenneth; and Nelson, Frank M., 4,183,089, Cl. 364-900.000.

Gillette Company, The: *See—*
Jacobson, Chester F.; and Poisson, Norman D., 4,182,033, Cl. 30-169.000.
Sokol, Phillip E.; and Tsai, Hu-Chu, 4,182,612, Cl. 8-10.100.

Gilvar, Martin, to Morgan Construction Company. Multi-line rolling system. 4,182,148, Cl. 72-228.000.

Giorcelli, Giuliano: *See*—
Baldi, Luciano; Giorcelli, Giuliano; and Francese, Renato, 4,182,874, Cl. 544-204.000.
Girard, Howard W., to Girard, Inc. Dental prophylactic right angle hand piece. 4,182,041, Cl. 433-115.000.
Girard, Inc.: *See*—
Girard, Howard W., 4,182,041, Cl. 433-115.000.
Gisbourne, Bryan J., to Scapa-Porritt Limited. Papermakers fabrics. 4,182,381, Cl. 139-383.00A.
Gist-Brocades N.V.: *See*—
Bruynes, Cornelis A.; and de Koning, Jan J., 4,182,870, Cl. 544-16.000.
Givaudan Corporation: *See*—
Virgilio, Joseph A.; Wood, Thomas F.; Heilweil, Emanuel; and Brandman, Harold A., 4,182,730, Cl. 260-599.000.
Givens, Steven P.: *See*—
McDonald, Charles J.; Van Landingham, John V.; and Givens, Steven P., 4,182,417, Cl. 166-295.000.
GKN Transmissions Limited: *See*—
Forster, Brian M., 4,182,185, Cl. 73-462.000.
Gladrow, Elroy M., to Exxon Research & Engineering Co. Hydrocarbon treating catalyst. 4,182,693, Cl. 252-455.00Z.
Glass, Emmett F., to Sperry Rand Corporation. Throttle control mechanism. 4,182,196, Cl. 74-491.000.
Glaxo Group Limited: *See*—
Croci, Marco; and Cotti, Gino, 4,182,709, Cl. 260-239.100.
Gneth nee Zalantai, Livia: *See*—
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resofszki, Gabor; and Gneth nee Zalantai, Livia, 4,182,892, Cl. 549-79.000.
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Greenfield, Walter. Apparatus for timing and recording sedimentation rate of fluid samples. 4,182,161, Cl. 73-61.400.
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Greenwood, John C., to International Standard Electric Corp. Mechanically biased semiconductor strain sensitive microphone. 4,182,937, Cl. 179-110.00B.
Greer, Charles H., to Piqua Engineering, Inc. Vertical baler with improved material hold-down and bale ejecting means. 4,182,236, Cl. 100-8.000.
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Gunnell, Thomas J., to Phillips Petroleum Company. Method for pelleting carbon black. 4,182,736, Cl. 264-117.000.
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Harrington, Michael L. Electrical cord holder. 4,182,005, Cl. 24-16.0PB.
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Hededam, Poul L., to Indukal ApS. Economizer for smoke tube boilers for high pressure steam and hot water. 4,182,276, Cl. 122-412.000.
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Heller, Adam; Miller, Barry; and Parkinson, Bruce A. Semiconductor liquid junction photocell using surface modified GaAs electrode. 4,182,796, Cl. 429-111.000.
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Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene copolymers containing substituents from tetraalkyl titanate. 4,182,834, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene copolymers containing nitroalkyl substituents. 4,182,835, Cl. 528-168.000.
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Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,182,792, Cl. 528-332.000.
Hermanson, Terry. Foldable paperboard umbrella. 4,182,352, Cl. 135-19.500.
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Herr, Charles H., Jr., to Caterpillar Tractor Co. Dynamometer test stand. 4,182,166, Cl. 73-134.000.
Herrmann, Donald C.; and Bazin, Lucas J., to RCA Corporation. Chroma keying selector system. 4,183,045, Cl. 358-22.000.
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Hibino, Masahiro; and Shima, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Waveform generator. 4,182,209, Cl. 84-1.010.
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Hicks, Darrell D., to Celanese Polymer Specialties Company. Cationic epoxide-amine reaction products. 4,182,833, Cl. 528-120.000.
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Sumitomo, Hiroyuki; Fukami, Katsutoshi; Kobayashi, Kazuyuki; Doi, Masafumi; Kawanishi, Kenzo; and Yoshida, Keido, 4,182,411, Cl. 165-110.000.
Yoshida, Keido; Kobayashi, Kazuyuki; and Sumitomo, Hiroyuki, 4,182,410, Cl. 165-110.000.
Hitachi Cable, Ltd.: *See*—
Takano, Hideo; Shimohori, Yukio; and Fukuda, Shigeho, 4,182,734, Cl. 264-40.500.
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Aoki, Masaaki; Ono, Yuichi; Morioka, Makoto; Ito, Kazuhiro; Mori, Mitshiuro; and Kurata, Kazuhiro, 4,183,039, Cl. 357-17.000.
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Ito, Tomo, 4,182,291, Cl. 123-103.00R.
Kawagoe, Hiroto, 4,183,093, Cl. 365-104.000.
Koyanagi, Osamu; Natsui, Ken-ichi; and Yoshioka, Yoshio, 4,182,942, Cl. 200-148.00A.
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Weyer, Rudi; Hitzel, Volker; and Granzer, Ernold, 4,182,775, Cl. 424-319.000.
Hodge, Allan M. Commercial trash bin locking system. 4,182,530, Cl. 294-73.000.
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Bartmann, Wilhelm; Lerch, Ulrich; Teufel, Hermann; Scholkens, Bernward; and Beck, Gerhard, 4,182,773, Cl. 424-305.000.
Chae, Yung B.; and Kim, Dae W., 4,182,899, Cl. 560-142.000.
Landler, Josef; Hunger, Klaus; and Worfel, Erhard, 4,182,708, Cl. 260-208.000.
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Steinau, Peter, 4,182,350, Cl. 131-269.000.
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Wladika, Hans; and Sevenich, Theodor, 4,182,146, Cl. 72-202.000.
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Cohen, Noal; and Saucy, Gabriel, 4,182,719, Cl. 260-340.90R.
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Christenson, James G., 4,182,879, Cl. 544-290.000.
Krasso, Anna; and Krebs, Ernst-Peter, 4,182,766, Cl. 424-263.000.
Muller, Jean-Claude; and Ramuz, Henri, 4,182,867, Cl. 544-324.000.
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Krokos, Tom; and Hofrichter, Richard C., 4,182,062, Cl. 40-209.000.
Hogge, Jeffrey R.: *See*—
Allen, Richard W.; and Hogge, Jeffrey R., 4,182,053, Cl. 35-11.00R.
Hojyo, Tetsuya. Automatic electroplating apparatus. 4,182,669, Cl. 204-213.000.
Hokkaido Sugar Co., Ltd.: *See*—
Yamada, Masaru; Mori, Atsushi; Sato, Yoshiyasu; Terayama, Kenichi; and Miyatani, Shogo, 4,182,634, Cl. 127-55.000.
Holbrook, Edward M.; and Wallace, Joseph J. Solar energy system for heating and cooling of buildings utilizing moist air cycles. 4,182,406, Cl. 165-48.00S.
Holdeman, Adin F.: *See*—
Anderson, John D.; Holdeman, Adin F.; and Moddelmog, Dwight C., 4,182,102, Cl. 56-344.000.
Holec, Lubomir. Meat tenderizer device. 4,182,002, Cl. 17-30.000.
Holk, Albert J., Jr.; and Boik, Arnold R., to Continental Can Company, Inc. Lever action tab system for easy opening ends. 4,182,460, Cl. 220-271.000.
Hollrock, J. Richard. Machine for washing golf balls and the like. 4,181,996, Cl. 15-21.00A.
Holman, James G., to United States of America, Navy. Anti-jam device for a conical scan tracking radar. 4,183,023, Cl. 343-18.00E.
Holmstrand, Allan L.: *See*—
Calderon, Arthur, Jr.; Hennenfent, Douglas J.; and Holmstrand, Allan L., 4,182,643, Cl. 156-151.000.
Holmstrem, Andrew B.: *See*—
Isgur, Irving E.; Holmstrem, Andrew B.; and Hayes, Norman J., 4,182,649, Cl. 162-101.000.
Holtorf, Erhard, to Ferrero OHG. Hand operated stamp. 4,182,241, Cl. 101-405.000.

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Ikenoya, Yasuo; and Uchida, Masaaki, 4,182,297, Cl. 123-124.00A.
Yagi, Shizuo; Fujii, Isao; and Kogure, Hiroshi, 4,182,284, Cl. 123-75.00B.
Yagi, Shizuo; Fujii, Isao; and Nishikawa, Masayasu, 4,182,285, Cl. 123-75.00B.
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Berkhof, Hendrikus, 4,182,488, Cl. 236-92.00A.
Mott, Richard C., 4,182,180, Cl. 73-336.000.
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Tschudy, Donald B., 4,182,618, Cl. 55-374.000.

Horizon Manufacturing Corporation: *See—*
Anderson, Eugene R., 4,182,748, Cl. 423-579.000.

Horn, Jurgen; Albert, Winfried; Batz, Hans-Georg; and Nelbock-Hochstetter, Michael, to Boehringer Mannheim GmbH. Polyamide-fixed biologically active protein. 4,182,695, Cl. 260-6.000.

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Hort, Eugene V.: *See—*
De Thomas, Waldo R.; and Hort, Eugene V., 4,182,721, Cl. 260-347.800.

Hosaka, Akio: *See—*
Anzai, Makoto; and Hosaka, Akio, 4,182,292, Cl. 123-119.0EC.

Hosoya, Nobukazu, to Sanyo Electric Co., Ltd. Tint control signal generator for color television receiver. 4,183,049, Cl. 358-28.000.

Houbion, John A.; and Schafer, David E., to Monsanto Company. 3-Phenacylidene phthalide safening agents. 4,182,622, Cl. 71-88.000.

Houlbrook, Kenneth: *See—*
Gibson, James D. M.; Houlbrook, Kenneth; and Coulter, John P., 4,182,264, Cl. 118-306.000.

Hovis, James E.; Finke, Harry P.; and Leumann, Hans E., to Bloom Engineering Company, Inc. Protective refractory member. 4,182,609, Cl. 432-234.000.

Hozumi, Yukio; Kuwayama, Tuguo; and Kuroda, Yosinori, to Daicel Ltd. Process for removing volatile matter from styrene resin. 4,182,854, Cl. 528-500.000.

Hsieh, Chia-Lung: *See—*
Ramsay, Anne B.; Luebke, Delbert R.; Guzek, David T.; Hsieh, Chia-Lung; Roteman, Robert; and Leathem, William D., 4,182,756, Cl. 424-180.000.

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Huelsman, Kenneth A., to Hughes Aircraft Company. Peak deviation sampling. 4,183,087, Cl. 364-515.000.

Huff, Frank R.: *See—*
Cenker, Ronald P.; Fleming, Thomas W.; and Huff, Frank R., 4,183,096, Cl. 365-222.000.

Hughes Aircraft Company: *See—*
Huelsman, Kenneth A., 4,183,087, Cl. 364-515.000.

Hughes, Michael K.: *See—*
Des Marais, Thomas A.; and Hughes, Michael K., 4,182,728, Cl. 260-544.00Y.

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Hulscher, Rudolf A., to Three Parks Limited. Method for sorting cops, and spintubes used therein. 4,182,452, Cl. 209-569.000.

Hulsmann, Hans-Leo: *See—*
Franzmann, Giselher; and Hulsmann, Hans-Leo, 4,182,904, Cl. 562-401.000.

Humphrey Instruments Inc.: *See—*
Humphrey, William E., 4,182,572, Cl. 356-127.000.

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Hung, William M.: *See—*
Schmidt, Paul J.; and Hung, William M., 4,182,714, Cl. 260-315.000.

Hunger, Klaus: *See—*
Landler, Josef; Hunger, Klaus; and Worfel, Erhard, 4,182,708, Cl. 260-208.000.

Hunter, Samuel A.: *See—*
Stover, William H.; and Hunter, Samuel A., 4,182,613, Cl. 44-51.000.

Huppatz, John L.: *See—*
Harris, Roger L. N.; Huppatz, John L.; Phillips, John N.; and Witrzens, Barbara, 4,182,877, Cl. 544-172.000.

Hurley, George L., III; and Krystek, Michael S., to General Atomic Company. Rotating shaft pulse generating apparatus. 4,182,953, Cl. 250-231.0SE.

Hurley, John F., to Avco Corporation. Air pump for turbofan fuel control system. 4,182,119, Cl. 60-226.00R.

Hurliman, Russell J.; and Scribner, Frank F., to FMC Corporation. Root crop harvester and trimmer. 4,182,420, Cl. 171-38.000.

Hussey, James L.: *See—*
Buchanan, Harry C., Jr.; and Hussey, James L., 4,183,026, Cl. 343-715.000.

Hutchins, Ferris L., Jr.; and Gebhardt, James L., to Mead Corporation, The. Modular display device. 4,182,244, Cl. 108-91.000.

Hydra-Guard Corporation: *See—*
Oakey, Edwin J., 4,182,361, Cl. 137-296.000.

Hysen, P. Paul; Souder, James J.; and Waldorf, Lindsay E. Food holder temperature maintenance system. 4,182,405, Cl. 165-48.000.

I.W.S. Nominee Company Limited: *See—*
Gibson, James D. M.; Houlbrook, Kenneth; and Coulter, John P., 4,182,264, Cl. 118-306.000.

Iannucci, Dorothy T. Crab trap bait clamp and method of using. 4,182,068, Cl. 43-105.000.

Ichiyanagi, Toshikazu: *See—*
Iwashita, Tomonori; Uchidoi, Masanori; Ichiyanagi, Toshikazu; Taguchi, Tetsuya; Iura, Yukio; and Aizawa, Hiroshi, 4,182,562, Cl. 354-173.000.

ICI Americas Inc.: *See—*
Ford, Ernest C., Jr., 4,182,830, Cl. 528-75.000.

Identicator Corporation: *See—*
Smith, Jay, III; and Hedgcoth, Virgle, 4,182,261, Cl. 118-31.500.

Idesawa, Masanori: *See—*
Goto, Eiichi; Idesawa, Masanori; Sasaki, Tateaki; and Soma, Takashi, 4,182,958, Cl. 250-492.00A.

Ikeda, Shoji. Method of immediate estimation of compressive strength of concrete through quick hardening. 4,182,191, Cl. 73-803.000.

Ikenoya, Yasuo; and Uchida, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Heat control system for a two-cycle engine. 4,182,297, Cl. 123-124.00A.

Illuminati, Gabriello; Romano, Ugo; and Tesei, Renato, to Snamprogetti, S.p.A. Process for the preparation of aromatic carbonates. 4,182,726, Cl. 260-463.000.

Imagawa, Hiroshi: *See—*
Mizuno, Susumu; and Imagawa, Hiroshi, 4,182,610, Cl. 432-237.000.

Imaizumi, Masao, to Nippon Oil Company Limited. Process for continuously producing diisopropyl ether. 4,182,914, Cl. 568-697.000.

Imperial Chemical Industries Limited: *See—*
Caunt, Anthony D.; Fortuin, Michael S.; and Williams, Ian G., 4,182,816, Cl. 526-119.000.
Cooke, Brian A., 4,182,638, Cl. 148-6.15R.
Renfrew, Andrew H. M.; and Bostock, Stephen B., 4,182,720, Cl. 260-343.30R.
Tucker, Howard, 4,182,911, Cl. 568-633.000.

IMS Limited: *See—*
Ogle, Robert W., 4,182,326, Cl. 128-220.000.

Imura, Toshinori; and Yamanaka, Akira, to Minolta Camera Kabushiki Kaisha. Automatic focusing system for use in camera. 4,182,555, Cl. 354-25.000.

Inaba, Minoru: *See—*
Hieda, Shozo; Uehara, Yoshio; and Inaba, Minoru, 4,182,580, Cl. 405-43.000.
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Inaba, Naomi: *See—*
Ueno, Hiroshi; Inaba, Naomi; Makishima, Tukuo; Watanabe, Koh; and Wada, Shozo, 4,182,691, Cl. 252-429.00B.

Inaba, Yutaka, to Tokyo Medical and Dental University, President of. Double coeliac drainage tube made of silicone. 4,182,343, Cl. 128-350.00R.

Indukal ApS: *See—*
Hededam, Poul L., 4,182,276, Cl. 122-412.000.

Ingard, Karl U.: *See—*
Gorchev, Dimiter; and Ingard, Karl U., 4,182,430, Cl. 181-224.000.

Ingersoll Maschinen und Werkzeuge GmbH: *See—*
Striegl, Georg, 4,182,587, Cl. 407-113.000.

Ingraham, Glen E., to Colorguard Corporation. Thermoplastic resin-coated metallic substrate and the method of producing the same through use of a polyamide adhesive layer. 4,182,382, Cl. 140-3.00R.

Institut Francais du Petrole: *See—*
Bocard, Christian; Renault, Philippe; Seris, Henri; and Gatellier, Claude, 4,182,677, Cl. 210-36.000.

Institut Gornogo Dela Akademii Nauk Kazakhskoi SSR: *See—*
Zubarev, Anatoly I.; Osipovsky, Lev F.; and Shipov, Stanislav V., 4,182,421, Cl. 173-105.000.

Institut Merieux: *See—*
Ayme, Gerard, 4,182,751, Cl. 424-92.000.

Institut Textile de France: *See—*
Bardy, Michel, 4,182,169, Cl. 73-160.000.

Institute de Recherches et d'Etudes de Techniques Specifiques: *See—*
Durand, Francois; and Guillem, Christian, 4,182,521, Cl. 280-202.000.

Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst: *See—*
Ceauselu, Constantin O., 4,182,243, Cl. 104-138.00R.

International Business Machines Corp.: *See*—
Burke, Richard G.; and Kolodzey, James S., 4,183,034, Cl. 357-30.000.
Dennard, Robert H.; and Rideout, Vincent L., 4,182,636, Cl. 148-187.000.
Rideout, Vincent L., 4,183,040, Cl. 357-41.000.
Roberts, David J.; and Simmons, John, 4,183,085, Cl. 364-200.000.

International Paper Company: *See*—
Costa, Eugene, Jr.; and Godsay, Madhu P., 4,182,735, Cl. 264-54.000.

International Standard Electric Corporation: *See*—
Chown, Martin, 4,182,935, Cl. 179-15.0AL.
Greenwood, John C., 4,182,937, Cl. 179-110.00B.

International Telephone and Telegraph Corporation: *See*—
Maklad, Mokhtar S.; Sigel, George H., Jr.; and Bickel, Gary W., 4,182,664, Cl. 204-157.10H.

Interpretation Systems Incorporated: *See*—
Dalke, George W.; and Buchanan, Michael D., 4,183,046, Cl. 358-22.000.

Interstate Electronics Supply, Inc.: *See*—
Coffin, Calvin B.; and Christmann, Richard M., 4,182,990, Cl. 325-364.000.

Iodice, Robert M. Coilless magnetic pickup for stringed instrument. 4,182,213, Cl. 84-1.150.

Ipco Hospital Supply Corporation: *See*—
Weissman, Bernard, 4,182,615, Cl. 51-125.000.

Irick, Gether, Jr.; Ownby, James C.; and Wang, Richard H. S., to Eastman Kodak Company. Biheterocyclic ultraviolet stabilizers and their use in organic compositions. 4,182,703, Cl. 260-45.8RW.

Irvine, John K.; Mitchell, Michael D.; and Berk, Gunter H. Process for the manufacture of a dishwashing detergent. 4,182,683, Cl. 252-99.000.

Isayama, Takuro; and Fukazawa, Takao, to Ricoh Company, Ltd. Ink filter clogging sensor and indicator. 4,183,029, Cl. 346-140.00R.

Isgur, Irving E.; Holmstrem, Andrew B.; and Hayes, Norman J., to W. R. Grace & Co. Polyurethane foam sheet and method. 4,182,649, Cl. 162-101.000.

Ishida, Nakao: *See*—
Maeda, Hiroshi; Kanamaru, Ryunosuke; and Ishida, Nakao, 4,182,752, Cl. 424-78.000.

Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,182,140, Cl. 68-5.00E.
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Ishihara, Tadashi: *See*—
Mibu, Hiroaki; Ishihara, Tadashi; Tanaka, Chiaki; and Esaki, Shingo, 4,182,665, Cl. 204-159.150.

Ishii, Noriyuki: *See*—
Uehara, Yoshio; Inaba, Minoru; Ishii, Noriyuki; and Kusumi, Yoshihisa, 4,182,581, Cl. 405-43.000.

Ishii, Shouichi, to Tokyo Shibaura Electric Co., Ltd. Regulated power supply. 4,183,082, Cl. 363-89.000.

Ishikawa, Hachiro; Tanabe, Hidekatu; and Usui, Keizo, to Mitsubishi Chemical Industries Limited. Process of the operation of a simulated moving bed. 4,182,633, Cl. 127-46.00A.

Ishikawa, Hidehiko: *See*—
Oguchi, Masanobu; Ishikawa, Hidehiko; Okuyama, Haruyoski; Uchida, Yasuo; and Izawa, Kiyoshi, 4,182,560, Cl. 354-106.000.

Ishikawa, Masayuki: *See*—
Shimamoto, Takio; and Ishikawa, Masayuki, 4,182,876, Cl. 544-237.000.

Isono, Katsuo; and Sanada, Seiji, to Sony Corporation. VIR-controlled hue correction circuit. 4,183,048, Cl. 358-28.000.

Ito, Kazuhiro: *See*—
Aoki, Masaaki; Ono, Yuichi; Morioka, Makoto; Ito, Kazuhiro; Mori, Mitshiuro; and Kurata, Kazuhiro, 4,183,039, Cl. 357-17.000.

Ito, Tomo, to Hitachi, Ltd. Dashpot with fast idle device for carburetor throttle. 4,182,291, Cl. 123-103.00R.

Ito, Yoichiro, to United States of America, Health, Education & Welfare. Micro-scale countercurrent chromatograph. 4,182,678, Cl. 210-198.00C.

Iura, Yukio: *See*—
Iwashita, Tomonori; Uchidoi, Masanori; Ichiyanagi, Toshikazu; Taguchi, Tetsuya; Iura, Yukio; and Aizawa, Hiroshi, 4,182,562, Cl. 354-173.000.

Iwase, Masaaki: *See*—
Saegusa, Takeo; Yamada, Akira; Iwase, Masaaki; and Iwatani, Akitoshi, 4,182,846, Cl. 528-341.000.

Iwashita, Tomonori; Uchidoi, Masanori; Ichiyanagi, Toshikazu; Taguchi, Tetsuya; Iura, Yukio; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Automatic winding up device for a camera. 4,182,562, Cl. 354-173.000.

Iwashita, Tomonori: *See*—
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Iwashita, Tomonori; and Shimizu, Masami, 4,182,557, Cl. 354-60.00R.

Iwatani, Akitoshi: *See*—
Saegusa, Takeo; Yamada, Akira; Iwase, Masaaki; and Iwatani, Akitoshi, 4,182,846, Cl. 528-341.000.

Izawa, Kiyoshi: *See*—
Oguchi, Masanobu; Ishikawa, Hidehiko; Okuyama, Haruyoski; Uchida, Yasuo; and Izawa, Kiyoshi, 4,182,560, Cl. 354-106.000.

Izbash, Anna S., Marina I. Lebedeva, administrators: *See*—
Sinelnikov, Alexandr V.; Patushinskaya, Raisa S.; Freidgeim, Lazar I.; Bizev, Anatoly A.; Druzhkova, Larisa M.; Salimov, Vyacheslav K.; Lebedich, Sergei P.; Lvov, Sergei L.; Minkina, Margarita E.; Shurygin, Alexandr P.; Levin, Valery S.; Faradzh-Zade, Solmaz A.; Lebedev, Igor V., deceased; and Lebedeva, Marina I., administrator, 4,182,358, Cl. 137-115.000.

J. M. Voith GmbH: *See*—
Grupp, Hans, 4,182,170, Cl. 83-177.000.

Jackle, William A., to Thiokol Corporation. Polyether based urethanes with superior dynamic properties. 4,182,825, Cl. 528-44.000.

Jackson, Winston J.; and Kuhfuss, Herbert F., to Eastman Kodak Company. Poly(ester-amides)prepared from an aromatic dicarboxylic acid, ethylene glycol and a p-acylaminobenzoic acid. 4,182,842, Cl. 528-292.000.

Jacobson, Chester F.; and Poisson, Norman D., to Gillette Company, The. Scraper assembly. 4,182,033, Cl. 30-169.000.

Jahn, Ulrich: *See*—
Thiele, Kurt; Armed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,182,902, Cl. 562-468.000.

James, David F., to Mattel, Inc. Cap-firing arm for a toy figure. 4,182,075, Cl. 46-118.000.

James L. Day Co. Inc.: *See*—
Day, James L., 4,182,367, Cl. 137-557.000.

Janin, Raymond, to Rhone-Poulenc S.A. Process for the preparation of thiazolesulphenamides. 4,182,873, Cl. 544-133.000.

Jannsen, Edward M. Method for perforating water well pipe casings. 4,182,418, Cl. 166-298.000.

Japan Storage Battery Co., Ltd.: *See*—
Mibu, Hiroaki; Ishihara, Tadashi; Tanaka, Chiaki; and Esaki, Shingo, 4,182,665, Cl. 204-159.150.

Japan Synthetic Rubber Co., Ltd.: *See*—
Makino, Kenya; Komatsu, Koei; Takeuchi, Yasumasa; and Endo, Masayuki, 4,182,813, Cl. 526-92.000.

Jenkner, Herbert; and Strang, Robert, to Chemische Fabrik Kalk GmbH. Flame-retardant agents for phenolic resins and process for their production. 4,182,706, Cl. 260-45.95G.

Jenoptik Jena G.m.b.H.: *See*—
Quillfeldt, Winfried, 4,182,574, Cl. 356-318.000.

Jeris, John S., to Ecolotrol, Inc. Waste treatment process. 4,182,675, Cl. 210-8.000.

Jezo, William P.: *See*—
Douglas, Robert L.; and Jezo, William P., 4,182,979, Cl. 318-434.000.

JGC Corporation: *See*—
Nishida, Fusao; Ueno, Toshihiro; Yamada, Tomiaki; Suzuki, Noriyuki; Takeda, Takehiko; Yanagihara, Tsutomu; Adachi, Katsuhiko; Asanabe, Tadashi; Ohsato, Katsuaki; Tsuda, Kintaro; and Watanabe, Keiichiro, 4,182,745, Cl. 423-239.00A.

Johnson, Bruce D.: *See*—
Viegas, Herman H.; Johnson, Bruce D.; and Volk, Rodney H., 4,182,134, Cl. 62-298.000.

Johnson, Clark E., Jr.; and Main, William F., to Buckeye International, Inc. High speed data recording arrangement. 4,183,028, Cl. 346-35.000.

Johnson, Ralph E., to Singer Company, The. Bobbin thread control means for a lock stitch sewing machine. 4,182,250, Cl. 112-184.000.

Johnson, Robert H. Power recovery and feedback system. 4,182,127, Cl. 60-618.000.

Johnson, Russell L., to Kimberly-Clark Corporation. Perineal shield and discharge containment device. 4,182,334, Cl. 128-287.000.

Johnson, William R., to Chinook Manufacturing Co. Apollo model fireplace. 4,182,305, Cl. 126-120.000.

Johnston Laboratories, Inc.: *See*—
Ahnell, Joseph E.; Broman, Rodney L.; and Waters, John R., 4,182,656, Cl. 435-34.000.

Joly, Michel: *See*—
Denninger, Claude; Joly, Michel; and Tabet, Jean-Noel, 4,182,620, Cl. 71-65.000.

Jones, Allen P.; and Knopf, Robert J., to Union Carbide Corporation. Polyurethane hydrogels having enhanced wetting rates. 4,182,827, Cl. 528-60.000.

Jones, Barry M., to QC Glide Co. Combined parting bead extender and weather strip cover for window installations. 4,182,081, Cl. 49-434.000.

Jones, Darrell L.: *See*—
Panicker, Narayana N.; Hettinger, Fredric L.; and Jones, Darrell L., 4,182,584, Cl. 405-195.000.

Jones, David A.: *See*—
Maust, Daniel C.; and Jones, David A., 4,181,999, Cl. 15-119.00A.
O'Dwyer, Michael F.; Feroce, John J.; and Jones, David A., 4,182,577, Cl. 403-74.000.

Jones, Robert E. Brick handling and forming voids in layers of bricks. 4,182,442, Cl. 198-422.000.

Jones, Sandra W.: *See*—
Giles, James H.; Stultz, Jeffery H.; and Jones, Sandra W., 4,182,920, Cl. 568-895.000.

Jordan, Robert D. Energy storage system. 4,182,967, Cl. 310-74.000.

Jos. Schneider & Co.: *See*—
Bauer, Klaus, 4,182,565, Cl. 354-224.000.

Juergens, Walter. Pallet feeding apparatus. 4,182,440, Cl. 193-35.00A.

Jung, Michel: *See*—
Metcalf, Brian W.; and Jung, Michel, 4,182,891, Cl. 546-243.000.

Jurenz, Rolf; and Kodalle, Horst, to VEB Pentacon Dresden Kamera und Kinowerke. Focusing screen for photographic cameras. 4,182,564, Cl. 354-200.000.

K. J. Law Engineers, Inc.: *See*—
Fohey, Donald R., 4,182,164, Cl. 73-83.000.

Kabanov, Viktor A.: *See*—
Bocharov, Jury N.; Kabanov, Viktor A.; Martynova, Marina A.; Popov, Valery G.; Smetanjuk, Vladimir I.; and Fedorov, Viktor V., 4,182,811, Cl. 526-69.000.

Kabushiki Kaisha Morita Seisakusho: *See*—
Tada, Yasuyuki; and Ohta, Yutaka, 4,182,036, Cl. 433-2.000.

Kabushiki Kaisha Saginomiya Seisakusho: *See*—
Tashiro, Fuminori, 4,182,941, Cl. 200-83.00C.

Kabushiki Kaisha Senzaki Seisakusho: *See*—
Senzaki, Hiroshi, 4,182,429, Cl. 181-144.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Chihara, Hiroyuki, 4,182,108, Cl. 58-4.00A.
Fujimori, Kazuyoshi; and Mitsuishi, Akio, 4,182,576, Cl. 400-221.000.
Kamiwaki, Osamu; and Onishi, Wataru, 4,182,110, Cl. 58-23.0BA.

Kafunek, Pavel: *See*—
Novak, Petr; Pellant, Jaroslav; Zuna, Jaroslav; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,183,042, Cl. 357-82.000.

Kaieda, Shozo; Mutoh, Masayuki; and Kamimura, Kuniaki, to Minolta Camera Kabushiki Kaisha. Ink jet recording apparatus. 4,183,030, Cl. 346-140.00R.

Kaiser Steel Corporation: *See*—
Powers, Joseph E.; and Grimoldi, Ranoldo H., 4,182,160, Cl. 73-49.500.

Kakugo, Masahiro: *See*—
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; and Suzuki, Takatoshi, 4,182,852, Cl. 528-494.000.

Kali-Chemie Pharma GmbH: *See*—
Asai, Akiji; Ban, Ivan; David, Samuel; and Thies, Peter W., 4,182,889, Cl. 546-197.000.

Kallai, Charles; Kallai, Valerie; and Kallai, Charles, Jr., to Hamilton Mould Tool & Die Limited. Bicycle seat supporting means. 4,182,508, Cl. 267-132.000.

Kallai, Charles, Jr.: *See*—
Kallai, Charles; Kallai, Valerie; and Kallai, Charles, Jr., 4,182,508, Cl. 267-132.000.

Kallai, Valerie: *See*—
Kallai, Charles; Kallai, Valerie; and Kallai, Charles, Jr., 4,182,508, Cl. 267-132.000.

Kamimura, Kuniaki: *See*—
Kaieda, Shozo; Mutoh, Masayuki; and Kamimura, Kuniaki, 4,183,030, Cl. 346-140.00R.

Kamiwaki, Osamu; and Onishi, Wataru, to Kabushiki Kaisha Suwa Seikosha. Electronic wristwatch including auxiliary power supply. 4,182,110, Cl. 58-23.0BA.

Kamiya, Takashi; Hashimoto, Masashi; Hemmi, Keiji; and Takeno, Hidekazu, to Fujisawa Pharmaceutical Co., Ltd. Hydroxyaminohydrocarbonphosphonic acid derivatives and use thereof as an antibiotic. 4,182,758, Cl. 424-211.000.

Kamyr, Incorporated: *See*—
Prough, James R., 4,182,177, Cl. 73-290.00V.

Kan, Hirofumi: *See*—
Namizaki, Hirofumi; Susaki, Wataru; and Kan, Hirofumi, 4,183,038, Cl. 357-17.000.

Kanagawa, Shuichi; and Miki, Tamotsu, to Sumitomo Chemical Company, Limited. Elastomer. 4,182,803, Cl. 526-313.000.

Kanamaru, Ryunosuke: *See*—
Maeda, Hiroshi; Kanamaru, Ryunosuke; and Ishida, Nakao, 4,182,752, Cl. 424-78.000.

Kandler, Joachim: *See*—
Strauss, Georg; Portz, Wilhelm; Braun, Albert; Kandler, Joachim; Komorniczyk, Klaus; and Thiel, Hans-Dieter, 4,182,626, Cl. 75-58.000.

Kaneno, Masayuki; Oda, Isao; and Yamamoto, Noboru, to NGK Insulators, Ltd. Transparent polycrystalline alumina and high pressure vapor discharge lamp. 4,182,972, Cl. 313-221.000.

Kano, Fumio: *See*—
Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,182,457, Cl. 215-1.00C.

Kao Soap Co., Ltd.: *See*—
Moriyama, Noboru; Aoki, Yoshio; and Furuyama, Yukihiro, 4,182,614, Cl. 44-51.000.

Kaplan, Murray A.: *See*—
Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., 4,182,863, Cl. 544-26.000.

Karcher, Thomas D., to Hansen Manufacturing Company, The. Air conditioning charging apparatus coupling. 4,182,370, Cl. 137-614.040.

Kashio, Toshio, to Casio Computer Co., Ltd. Electronic time keeping device with time-shared timing indicator. 4,182,113, Cl. 58-4.00A.

Kass, Kenneth J. Apparatus and method for harvesting and windrowing corn. 4,182,098, Cl. 56-14.500.

Kataoka, Shoei; Tateno, Hiroshi; Fujisada, Hiroyuki; Yamada, Hideo; Kawashima, Mitsuo; and Komamiya, Yasuo, to Kogyo Gijutsuin. Negative resistance element circuit combinations. 4,182,964, Cl. 307-299.000.

Kato, Kiyotaka; and Ohya, Tadahiko, to Toyoda-Koki Kabushiki-Kaisha. Tool magazine with a tool removal device. 4,182,021, Cl. 29-568.000.

Katsof, Barry: *See*—
Lekhtman, Gregory, 4,183,019, Cl. 340-539.000.

Kausch, Erwin: *See*—
Seehofer, Friedlieb; and Kausch, Erwin, 4,182,348, Cl. 131-10.00R.

Kawagoe, Hiroto, to Hitachi, Ltd. Semiconductor integrated circuit device composed of insulated gate field-effect transistor. 4,183,093, Cl. 365-104.000.

Kawakita, Kenji: *See*—
Ochiai, Michihiko; Morimoto, Akira; Matsushita, Yoshihiro; Aki, Osami; Okada, Taiiti; and Kawakita, Kenji, 4,182,868, Cl. 544-21.000.

Kawamura, Hiroyuki: *See*—
Fujii, Setsuro; Kawamura, Hiroyuki; Taira, Seizo; Matsui, Ryoji; Sakurai, Yojiro; and Okutome, Toshiyuki, 4,182,897, Cl. 560-19.000.

Kawanishi, Kenzo: *See*—
Sumitomo, Hiroyuki; Fukami, Katsutoshi; Kobayashi, Kazuyuki; Doi, Masafumi; Kawanishi, Kenzo; and Yoshida, Keido, 4,182,411, Cl. 165-110.000.

Kawashima, Mitsuo: *See*—
Kataoka, Shoei; Tateno, Hiroshi; Fujisada, Hiroyuki; Yamada, Hideo; Kawashima, Mitsuo; and Komamiya, Yasuo, 4,182,964, Cl. 307-299.000.

Kay, Ira. Device for storing, transporting and mixing reactive ingredients. 4,182,447, Cl. 206-220.000.

Kayaku Antibiotic Research Co., L:d.: *See*—
Maeda, Hiroshi; Kanamaru, Ryunosuke; and Ishida, Nakao, 4,182,752, Cl. 424-78.000.

Kayamori, Hiroshi: *See*—
Kominami, Naoya; Fukumi, Hirokazu; Yamawaki, Naokuni; Nomura, Junji; and Kayamori, Hiroshi, 4,182,267, Cl. 119-3.000.

Kayser, Detlev: *See*—
Behpour, Ahmad; Kayser, Detlev; and Martin, Gerhard, 4,182,770, Cl. 424-273.00R.

Keezer, Richard C.; and Geils, Ronald H., to Xerox Corporation. Optical storage medium using the frequency domain. 4,183,094, Cl. 365-127.000.

Keith Manufacturing: *See*—
Wagner, Wesley R., 4,182,604, Cl. 425-237.000.

Kelling, Fridtjof E. T.: *See*—
Theyse, Frederik H.; and Kelling, Fridtjof E. T., 4,182,480, Cl. 233-27.000.

Kemper, James M., to Monogram Industries, Inc. Macerator pump. 4,182,499, Cl. 241-46.020.

Keneman, Scott A.; and Endriz, John G., to RCA Corporation. Electron multiplier with ion bombardment shields. 4,182,968, Cl. 313-105.00R.

Kenner, SamuelK. 360 Degree speakers. 4,182,931, Cl. 179-1.00E.

Kennon, James L., to Nordson Corporation. Electrostatic spray gun. 4,182,490, Cl. 239-3.000.

Kentschke, Rudolf: *See*—
Bernemann, Paul; Kentschke, Rudolf; and Wieland, Dieter, 4,182,814, Cl. 526-92.000.

Keske, Frank E.: *See*—
Stratton, Michael K.; Engquist, Karl R.; Keske, Frank E.; Powers, Harold C.; and Sparks, James D., 4,182,122, Cl. 60-322.000.

Kesselman, Joseph J. On-off snap action water and heat saving valve attachment for sink spout. 4,181,987, Cl. 4-191.000.

Kessler, Frank L.: *See*—
Schall, Frederick R.; and Kessler, Frank L., 4,182,087, Cl. 52-169.700.

Kewp Electronic Systems, Inc.: *See*—
Evans, James D.; and Pool, Sam L., 4,183,056, Cl. 358-108.000.

Kewpie Kabushiki Kaisha: *See*—
Furuta, Naofumi; and Saito, Hisatoshi, 4,182,571, Cl. 356-53.000.

Keys, Charles T.; and Ratti, Renald A., to Bell Telephone Laboratories, Incorporated. Method and apparatus for detecting irregular telephone calls. 4,182,934, Cl. 179-7.00R.

Khokhar, Abdul R.: *See*—
Tobe, Martin L.; Khokhar, Abdul R.; and Braddock, Peter D. M., 4,182,724, Cl. 260-429.00R.

Kidd, Samuel M., to National Research Development Corporation. Approach slope indicators. 4,183,078, Cl. 362-231.000.

Kienle, Fritz: *See*—
Bretzger, Reinhard; Kienle, Fritz; and Lindenthal, Hans, 4,182,011, Cl. 29-148.40A.

Kihara, Nobutoshi; and Watanabe, Yoshimi, to Sony Corporation. Helical scan VTR with means for displacing head along track direction. 4,183,067, Cl. 360-75.000.

Kim, Dae W.: *See*—
Chae, Yung B.; and Kim, Dae W., 4,182,899, Cl. 560-142.000.

Kim, Seung K.; and Shouse, John F., Jr., to General Electric Company. Chroma level stabilizer. 4,183,047, Cl. 358-27.000.

Kimberly-Clark Corporation: *See*—
Johnson, Russell L., 4,182,334, Cl. 128-287.000.
Selke, William A., 4,182,349, Cl. 131-140.00C.

Kimura, Ryoichi, to Sumitomo Electric Industries, Ltd. Abrasion alarm device for disk brake. 4,183,012, Cl. 340-52.00A.

Kindred, Scott G.: *See*—
Galaini, James L.; and Kindred, Scott G., 4,182,541, Cl. 339-125.00R.

Kiovsky, Joseph R.; and Goyette, William J., to Norton Company. Mordenite catalyst. 4,182,692, Cl. 252-455.00Z.

Kiser, Dennis D.: *See*—
Brindle, Dannie K.; and Shanfelt, Donald Y., 4,182,307, Cl. 126-432.000.

Kishimoto, Akira: *See*—
Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,182,457, Cl. 215-1.00C.

Kissinger, John A., to General Atomic Company. Radial flow heat exchanger. 4,182,413, Cl. 165-163.000.

Kita, Toru, to Nissan Motor Co., Limited. Fluid flow rate measuring apparatus. 4,182,165, Cl. 73-194.0VS.

Kitamura, Kazuhiko, to Aisin Seiki Kabushiki Kaisha. Thermally responsive valve. 4,182,485, Cl. 236-48.00R.

Kitaura, Mashio: *See*—
Yamada, Seiji; Yoshiyama, Ichiro; and Kitaura, Mashio, 4,182,573, Cl. 356-218.000.

Kitzing, Rainer; Scott, John G. V.; Webb, Terence C.; and Evans, Graham, to Ciba-Geigy Aktiengesellschaft. Amino-substituted hydroxy-pyridones. 4,182,886, Cl. 546-304.000.

Kjose, Kenneth L. Combined golf bag and equipment carrier. 4,182,391, Cl. 150-1.50R.

Klages, Arthur C. Fabric puller. 4,182,248, Cl. 112-121.260.

Klay, William F. Door lock. 4,182,528, Cl. 292-169.170.

Klett, Gene R.; and Thies, Jerome A., to Caterpillar Tractor Co. Releasable corner tooth assembly. 4,182,057, Cl. 37-141.00T.

Klimeck, Edward F.: *See*—
McArdle, James M.; and Klimeck, Edward F., 4,182,945, Cl. 206-385.000.

Kloek, James A., to Monsanto Company. Bicyclothiadiazinones. 4,182,623, Cl. 71-91.000.

Klosel, Georg W. Signal display. 4,182,063, Cl. 40-610.000.

Klotzbier, Kenneth D.: *See*—
Everson, Benjamin A.; and Klotzbier, Kenneth D., 4,182,262, Cl. 118-44.000.

Kluger, Michael A.; and Colpaert, James J., to Bendix Corporation, The. Torque member for a drum brake. 4,182,439, Cl. 188-335.000.

Knaak, Rudiger, to Koppers-Wistra-Ofenbau GmbH. Roller-hearth furnace with shielded rollers. 4,182,611, Cl. 432-245.000.

Knight, Robert J.: *See*—
Badmin, John S.; and Knight, Robert J., 4,182,772, Cl. 424-304.000.

Knittel, Richard R., to Egan Machinery Company. Multilayer tubular extrusion die. 4,182,603, Cl. 425-133.100.

Knopf, Robert J.: *See*—
Jones, Allen P.; and Knopf, Robert J., 4,182,827, Cl. 528-60.000.

Kobayashi, Kazuyuki: *See*—
Sumitomo, Hiroyuki; Fukami, Katsutoshi; Kobayashi, Kazuyuki; Doi, Masafumi; Kawanishi, Kenzo; and Yoshida, Keido, 4,182,411, Cl. 165-110.000.
Yoshida, Keido; Kobayashi, Kazuyuki; and Sumitomo, Hiroyuki, 4,182,410, Cl. 165-110.000.

Kobe Steel, Ltd.: *See*—
Konishi, Kazunori; Wakayama, Hiromu; Nagatani, Toshihiro; and Eto, Fumio, 4,182,042, Cl. 33-18.00R.

Kober, Rudolf, to Siemens Aktiengesellschaft. Computer system having individual computers with data filters. 4,183,086, Cl. 364-200.000.

Kobishi Electric Co., Ltd.: *See*—
Sakaguchi, Mitsuo, 4,183,018, Cl. 340-396.000.

Kodalle, Horst: *See*—
Jurenz, Rolf; and Kodalle, Horst, 4,182,564, Cl. 354-200.000.

Koei Chemical Co., Ltd.: *See*—
Watanabe, Nanao; and Akimoto, Haruhito, 4,182,880, Cl. 546-13.000.

Koerner, Gotz; Schmidt, Gunter; and Nickel, Friedhelm. Preparation for shrinkproofing wool and process for the production of the preparation. 4,182,682, Cl. 252-8.600.

Kogure, Hiroshi: *See*—
Yagi, Shizuo; Fujii, Isao; and Kogure, Hiroshi, 4,182,284, Cl. 123-75.00B.

Kogyo Gijutsuin: *See*—
Kataoka, Shoei; Tateno, Hiroshi; Fujisada, Hiroyuki; Yamada, Hideo; Kawashima, Mitsuo; and Komamiya, Yasuo, 4,182,964, Cl. 307-299.000.

Kohashi, Tadao: *See*—
Tomii, Kaoru; and Kohashi, Tadao, 4,183,053, Cl. 358-60.000.

Kolodzey, James S.: *See*—
Burke, Richard G.; and Kolodzey, James S., 4,183,034, Cl. 357-30.000.

Komamiya, Yasuo: *See*—
Kataoka, Shoei; Tateno, Hiroshi; Fujisada, Hiroyuki; Yamada, Hideo; Kawashima, Mitsuo; and Komamiya, Yasuo, 4,182,964, Cl. 307-299.000.

Komatsu, Koei: *See*—
Makino, Kenya; Komatsu, Koei; Takeuchi, Yasumasa; and Endo, Masayuki, 4,182,813, Cl. 526-92.000.

Kominami, Naoya; Fukumi, Hirokazu; Yamawaki, Naokuni; Nomura, Junji; and Kayamori, Hiroshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Apparatus for keeping aquatic animals alive over long period of time. 4,182,267, Cl. 119-3.000.

Komorniczyk, Klaus: *See*—
Strauss, Georg; Portz, Wilhelm; Braun, Albert; Kandler, Joachim; Komorniczyk, Klaus; and Thiel, Hans-Dieter, 4,182,626, Cl. 75-58.000.

Kondo, Shigeo; Yoshiike, Nobuyuki; and Fukai, Masakazu, to Matsushita Electric Industrial Co., Ltd. Primary battery utilizing iodine charge transfer complex having a quaternary ammonium group. 4,182,797, Cl. 429-191.000.

Konishi, Kazunori; Wakayama, Hiromu; Nagatani, Toshihiro; and Eto, Fumio, to Kobe Steel, Ltd. Marking device. 4,182,042, Cl. 33-18.00R.

Konishiroku Photo Industry Co. Ltd.: *See*—
Oguchi, Masanobu; Ishikawa, Hidehiko; Okuyama, Haruyoski; Uchida, Yasuo; and Izawa, Kiyoshi, 4,182,560, Cl. 354-106.000.

Koppers-Wistra-Ofenbau GmbH: *See*—
Knaak, Rudiger, 4,182,611, Cl. 432-245.000.

Koshiishi, Kiyozo; and Mizusaki, Takashi, to Olympus Optical Co., Ltd. Ion selective electrode. 4,182,668, Cl. 204-195.00L.

Koyanagi, Osamu; Natsui, Ken-ichi; and Yoshioka, Yoshio, to Hitachi, Ltd. Puffer-type gas-blast circuit breaker. 4,182,942, Cl. 200-148.00A.

Kozacka, Frederick J., to Gould Inc. Fuse having helically wound fusible element and support therefor. 4,183,004, Cl. 337-273.000.

Kozlow, William J. Adhesive bandage and package. 4,182,449, Cl. 206-441.000.

Kramer, Erich: *See*—
Goebel, Hermann; and Kramer, Erich, 4,182,713, Cl. 548-259.000.

Krasso, Anna; and Krebs, Ernst-Peter, to Hoffmann-La Roche Inc. Naphth[2,3-d]imidazoles. 4,182,766, Cl. 424-263.000.

Kratina, Jindrich: *See*—
Novak, Petr; Pellant, Jaroslav; Zuna, Jaroslav; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,183,042, Cl. 357-82.000.

Kraus, Edmund J.: *See*—
Kraus, Robert A.; and Kraus, Edmund J., 4,182,124, Cl. 60-398.000.

Kraus, Robert A.; and Kraus, Edmund J. Gravity augmented air compression turbine power plant. 4,182,124, Cl. 60-398.000.

Krause, Helmuth W. Surface cleaning and rinsing device. 4,182,001, Cl. 15-320.000.

Krauss, Siegfried: *See*—
Laar, Erwin; Wagner, Karl-Heinz; and Krauss, Siegfried, 4,182,567, Cl. 354-299.000.

Krebs, Ernst-Peter: *See*—
Krasso, Anna; and Krebs, Ernst-Peter, 4,182,766, Cl. 424-263.000.

Kreitzer, Melvyn H., to Vivitar Corporation. Compact wide angle lens. 4,182,549, Cl. 350-215.000.

Krepelka, Jiri: *See*—
Beran, Milos; Krepelka, Jiri; Semonsky, Miroslav; Rezabek, Karel; Seda, Miroslav; and Auskova, Marie, 4,182,883, Cl. 546-67.000.

Krieger, Bernard: *See*—
Wayne, I. R.; and Krieger, Bernard, 4,182,946, Cl. 219-10.55A.

Krieger, Karl, to Hermann Hemscheidt Maschinenfabrik GmbH & Co. Double-plate control device. 4,182,585, Cl. 405-302.000.

Kristiansson, Erik, to Pullmax AB. Device for tool changing in punching machines. 4,182,022, Cl. 29-568.000.

Krokos, Tom; and Hofrichter, Richard C., to Ticketcheck International Limited. License plate lock box assembly. 4,182,062, Cl. 40-209.000.

Kruh, Daniel, to General Electric Company. Process of breaking up gel of polyamide-imide. 4,182,853, Cl. 528-503.000.

Krulik, Gerald A., to McGean Chemical Company, Inc. Method for electroless plating on nonconductive substrates using palladium/tin catalyst in aqueous solution containing a hydroxy substituted organic acid. 4,182,784, Cl. 427-304.000.

Krupp-Koppers GmbH: *See*—
Forster, Manfred; and Geidis, Ulrich, 4,182,957, Cl. 250-356.000.

Kryger, W. M. Packaging apparatus for fragile articles. 4,182,450, Cl. 206-448.000.

Krystek, Michael S.: *See*—
Hurley, George L., III; and Krystek, Michael S., 4,182,953, Cl. 250-231.0SE.

Kuceski, Vincent P., to C.P. Hall Company, The. Preparation of polyaminoamide resin in the absence of water. 4,182,844, Cl. 528-335.000.

Kuder, Benedict A., to B. A. Kuder Co. Weld back up assembly. 4,182,951, Cl. 219-160.000.

Kudlich, Hans: *See*—
Zimmer, Peter; Kudlich, Hans; and Schweitzer, Karl, 4,182,660, Cl. 204-11.000.

Kuebler & Co.: *See*—
Kuebler, Siegfried, 4,182,512, Cl. 273-73.00C.

Kuebler, Siegfried, to Kuebler & Co. Racket for playing tennis or similar ball games. 4,182,512, Cl. 273-73.00C.

Kuhfuss, Herbert F.: *See*—
Jackson, Winston J.; and Kuhfuss, Herbert F., 4,182,842, Cl. 528-292.000.

Kuhlman, Harvey G.: *See*—
Renner, Jerome A., 4,182,390, Cl. 145-1.00A.

Kuintzle, Charles: *See*—
Exley, John T.; and Kuintzle, Charles, 4,182,117, Cl. 60-39.070.

Kulkarni, Ashok V.: *See*—
Agrawala, Ashok K.; Kulkarni, Ashok V.; and Paul, Edwin H., Jr., 4,183,013, Cl. 340-146.3AC.

Kulkarni, R. K. Assimilable hydrophilic prosthesis. 4,181,983, Cl. 3-1.000.

Kumoi, Sadakatsu: *See*—
Mabuchi, Shunsuke; Kumoi, Sadakatsu; and Tsuzuki, Kenji, 4,182,919, Cl. 568-861.000.

Kuniyoshi, Yasunobu: *See*—
Tsuchiya, Takao; Omori, Shouji; Kuniyoshi, Yasunobu; Matsuzaki, Atsushi; Akazawa, Susumu; and Tominaga, Kiyonori, 4,183,050, Cl. 358-34.000.

Kuraray Company Limited: *See*—
Yamauchi, Junichi; Yamada, Kunitake; and Shibatani, Kyoichiro, 4,182,035, Cl. 433-228.000.

Kurata, Kazuhiro: *See*—
Aoki, Masaaki; Ono, Yuichi; Morioka, Makoto; Ito, Kazuhiro; Mori, Mitshiuro; and Kurata, Kazuhiro, 4,183,039, Cl. 357-17.000.

Kuroda, Yosinori: *See*—
Hozumi, Yukio; Kuwayama, Tuguo; and Kuroda, Yosinori, 4,182,854, Cl. 528-500.000.
Kushigian, Anthony. Grinding wheel feed programmer. 4,182,083, Cl. 51-165.790.
Kusumi, Yoshihisa: *See*—
Uehara, Yoshio; Inaba, Minoru; Ishii, Noriyuki; and Kusumi, Yoshihisa, 4,182,581, Cl. 405-43.000.
Kusumi, Yukio: *See*—
Miyamura, Akio; Kusumi, Yukio; and Omoto, Naoichi, 4,182,894, Cl. 548-352.000.
Kutaragi, Ken; and Nakamura, Masayoshi, to Sony Corporation. Level indicating system. 4,183,025, Cl. 324-103.00P.
Kuwayama, Tuguo: *See*—
Hozumi, Yukio; Kuwayama, Tuguo; and Kuroda, Yosinori, 4,182,854, Cl. 528-500.000.
Kyowa Gas Chemical Industry Co., Ltd.: *See*—
Nagai, Haruo; Uehara, Hiroshi; and Nunokawa, Kunikazu, 4,182,821, Cl. 526-240.000.
Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., to Silonics, Inc. Ink supply system. 4,183,031, Cl. 346-140.00R.
Laar, Erwin; Wagner, Karl-Heinz; and Krauss, Siegfried, to AGFA-Gevaert, A.G. Apparatus for continuously processing photographic films or the like. 4,182,567, Cl. 354-299.000.
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Serboli, Giancarlo; Straziota, Maurizio; and La Barba, Nicolina, 4,182,804, Cl. 525-56.000.
Laber, Walter, to Deggendorfer Werft und Eisenbau GmbH. Multilayered tube sheet assembly for heat exchangers. 4,182,408, Cl. 165-70.000.
Lagerstrom, Gosta B.; and Nilsson, Nils-Inge, to Boliden Aktiebolag. Process and an apparatus for alkali-treatment of lignocellulosic material. 4,182,780, Cl. 426-636.000.
Lagerwerf, Harry; and Versluis, Ronald, to B. V. Neratoom. Tube sheet comprising two interspaced sheet members and heat exchanger comprising at least one such tube sheet. 4,182,407, Cl. 165-70.000.
Lagrou, Donald J.: *See*—
Strong, Grant H.; and Lagrou, Donald J., 4,182,441, Cl. 188-312.000.
Laks, Sid; and Evans, Thomas S., to Laks, Sid. Plastic wax cleaning and polishing composition and method of making same. 4,182,686, Cl. 252-119.000.
Lalk, Robert H.: *See*—
Smith, William L.; and Lalk, Robert H., 4,182,794, Cl. 428-537.000.
Lamartino, Salvatore P.; Richards, Louis R.; and Sandberg, Glenn A., to Formax, Inc. Food patty molding machine. 4,182,003, Cl. 17-32.000.
Land, Edwin H.; and Biber, Conrad H., to Polaroid Corporation. Fast charging electronic flash device. 4,182,561, Cl. 354-145.000.
Landler, Josef; Hunger, Klaus; and Worfel, Erhard, to Hoechst Aktiengesellschaft. Process for the preparation of azo pigments by diazotizing in a dipolar aprotic organic solvent and azo pigments obtained therefrom. 4,182,708, Cl. 260-208.000.
Lang-Ree, Nils: *See*—
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,182,231, Cl. 99-387.000.
Langeluddeke, Peter: *See*—
Soder, Alfons; Bieringer, Hermann; Burstell, Helmut; Langeluddeke, Peter; and Sachse, Burkhard, 4,182,624, Cl. 71-92.000.
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Saunders, Elmer J.; and Lappin, Terry A., 4,182,777, Cl. 426-62.000.
Larson, Daniel A., to Westinghouse Electric Corp. High pressure sodium vapor lamp with voltage rise compensator. 4,182,976, Cl. 315-49.000.
Larson, Richard I.: *See*—
Adomitis, John T.; and Larson, Richard I., 4,182,383, Cl. 141-5.000.
Larson, William M.; Patitsas, George P.; and Roennau, Raymond B., to Goodyear Tire & Rubber Company, The. Pneumatic rubber tire with adherent polyurethane sidewall. 4,182,393, Cl. 152-353.00R.
Laskin, Allen I.: *See*—
Naslund, Lars A.; and Laskin, Allen I., 4,182,860, Cl. 536-114.000.
Latassa, Frank M.: *See*—
Cassidy, Robert E.; Latassa, Frank M.; Roy, J. Arthur; and Ray, John G., 4,182,971, Cl. 313-177.000.
Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simoneit, Gunter; and Ries, Karl, to Mannesmann Aktiengesellschaft. Initializing ultrasonic test equipment with a particular reference element. 4,182,154, Cl. 73-1.0DV.
Latsch, Reinhard: *See*—
Zeller, Hans; Latsch, Reinhard; Brettschneider, Johannes; and Bianchi, Valerio, 4,182,295, Cl. 123-119.0EC.
Lauder, Alan, to Du Pont de Nemours, E. I., and Company. Ruthenium-containing perovskite catalysts. 4,182,694, Cl. 252-462.000.
Lawler, Doris G., executrix: *See*—
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Mitchell, John W., Sr.; Oyama, Kenneth H.; Lawler, John K., deceased; and Lawler, Doris G., executrix, 4,182,238, Cl. 100-99.000.
Lawson, Ernest E.: *See*—
Cottrell, Walter D., Jr.; and Lawson, Ernest E., 4,182,701, Cl. 260-38.000.
Lawson, John E.; and Dennis, Ronald D., to Mead Johnson & Company. 4-Tertiary-amino-2,6-diaminopyridine 1-oxides. 4,182,888, Cl. 546-193.000.
Lawson, Roger E., to Digital Equipment Corporation. Secondary storage facility with serial transfer of control messages. 4,183,084, Cl. 364-200.000.
Leathem, William D.: *See*—
Ramsay, Anne B.; Luebke, Delbert R.; Guzek, David T.; Hsieh, Chia-Lung; Roteman, Robert; and Leathem, William D., 4,182,756, Cl. 424-180.000.
Lebedev, Igor V., deceased: *See*—
Sinelnikov, Alexandr V.; Patushinskaya, Raisa S.; Freidgeim, Lazar I.; Bizev, Anatoly A.; Druzhkova, Larisa M.; Salimov, Vyacheslav K.; Lebedich, Sergei P.; Lvov, Sergei L.; Minkina, Margarita E.; Shurygin, Alexandr P.; Levin, Valery S.; Faradzh-Zade, Solmaz A.; Lebedev, Igor V., deceased; and Lebedeva, Marina I., administrator, 4,182,358, Cl. 137-115.000.
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Sinelnikov, Alexandr V.; Patushinskaya, Raisa S.; Freidgeim, Lazar I.; Bizev, Anatoly A.; Druzhkova, Larisa M.; Salimov, Vyacheslav K.; Lebedich, Sergei P.; Lvov, Sergei L.; Minkina, Margarita E.; Shurygin, Alexandr P.; Levin, Valery S.; Faradzh-Zade, Solmaz A.; Lebedev, Igor V., deceased; and Lebedeva, Marina I., administrator, 4,182,358, Cl. 137-115.000.
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Leblanc, Michele: *See*—
Courrier, Gilbert; Duchet, Michel; Leblanc, Michele; and Moirez, Jacques, 4,182,570, Cl. 356-28.000.
Le Can, Claude J. P. F.; Hart, Cornelis M.; and Wulms, Hendricus E. J., to U.S. Philips Corporation. Semiconductor device. 4,183,037, Cl. 357-44.000.
Lee Green Precision Industries Ltd.: *See*—
Ford, Mark W.; and Wearden, Thomas B., 4,182,017, Cl. 29-428.000.
Le Goff, Jean: *See*—
Gravey, Guy; Le Goff, Jean; and Gonin, Christian, 4,182,747, Cl. 423-491.000.
Leivenzon, Simon; and Leivenzon, Steven, to Firmaframe Nominees Proprietary Ltd. Door handle lock and latch mechanism for corrugated roller doors. 4,182,144, Cl. 70-100.000.
Leivenzon, Steven: *See*—
Leivenzon, Simon; and Leivenzon, Steven, 4,182,144, Cl. 70-100.000.
Lekhtman, Gregory, to Katsof, Barry; Matlin, Joel; and Gordon, Ronald. Money clip with light sensitive detector. 4,183,019, Cl. 340-539.000.
Lemmond, Charles Q., to General Electric Company. Electron beam matrix deflector manufactured by etching divergent slots. 4,182,010, Cl. 29-25.180.
Lenhart, Ronald A., to Precision Metal Fabricators, Inc. Air operated conveyor apparatus. 4,182,586, Cl. 406-87.000.
Lenzen, Glenn H.: *See*—
Earle, Michael; and Lenzen, Glenn H., 4,182,299, Cl. 123-188.00R.
Lerch, Ulrich: *See*—
Bartmann, Wilhelm; Lerch, Ulrich; Teufel, Hermann; Scholkens, Bernward; and Beck, Gerhard, 4,182,773, Cl. 424-305.000.
Lessieur, Piero D., to Compagnie Francaise des Petroles. Heat transfer system. 4,182,489, Cl. 126-422.000.
Lestak, Robert G.; and Christensen, Allison L., to SSP Products, Inc. Low conducting metal screen support flange. 4,182,379, Cl. 138-149.000.
Lestraden, Jacobus J. W. Method and apparatus for the conditioning of products. 4,182,049, Cl. 34-34.000.
Letter, Joseph D. Lawn mower and edger carriage. 4,182,100, Cl. 56-16.700.
Leumann, Hans E.: *See*—
Hovis, James E.; Finke, Harry P.; and Leumann, Hans E., 4,182,609, Cl. 432-234.000.
Lever, Clyde J., Jr.: *See*—
Carter, Joe M.; Lever, Clyde J., Jr.; and Scheidt, Gerald A., 4,182,107, Cl. 57-293.000.
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Sinelnikov, Alexandr V.; Patushinskaya, Raisa S.; Freidgeim, Lazar I.; Bizev, Anatoly A.; Druzhkova, Larisa M.; Salimov, Vyacheslav K.; Lebedich, Sergei P.; Lvov, Sergei L.; Minkina, Margarita E.; Shurygin, Alexandr P.; Levin, Valery S.; Faradzh-Zade, Solmaz A.; Lebedev, Igor V., deceased; and Lebedeva, Marina I., administrator, 4,182,358, Cl. 137-115.000.
Levine, Alfred B. Multiplexed electrostatic photocopier. 4,182,568, Cl. 355-8.000.
Lewis, Earl C. Electronic switching means for television projection arrangement. 4,183,063, Cl. 358-237.000.
Lewis, Kenneth. Rotary ball valve. 4,182,373, Cl. 137-625.440.

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Miserlis, Constantine D.; and Lewis, Peter J., 4,182,801, Cl. 526-77.000.

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Gerstner, Dieter, 4,183,021, Cl. 340-753.000.

Liebman, Theodore. DC to DC converter. 4,183,080, Cl. 363-18.000.

Lieder, Gaylerd M.; and Ayres, Richard H., to Bemis Company, Inc. Bag opening and filling apparatus. 4,182,094, Cl. 53-67.000.

Limbach, Peter K. F., to Alcan Research and Development Limited. Method of heat treatment of ductile metal strip. 4,182,635, Cl. 148-130.000.

Linde Aktiengesellschaft: *See*—
Berger, Michael, 4,182,268, Cl. 119-3.000.
Nasser, Gamal El Din; and Pocrnja, Anton, 4,182,132, Cl. 62-93.000.

Lindenthal, Hans: *See*—
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Linke, Walter R.: *See*—
Funk, James B., Jr.; and Linke, Walter R., 4,182,956, Cl. 250-239.000.

Lion Dentrifice Co., Ltd., The: *See*—
Hayashi, Eisaku; Higashino, Takeo; and Suzuki, Shin-ichi, 4,182,878, Cl. 544-262.000.

Lion Fat and Oil Co., Ltd., The: *See*—
Miyamura, Akio; Kusumi, Yukio; and Omoto, Naoichi, 4,182,894, Cl. 548-352.000.

List, Hans: *See*—
Denk, Heimo, 4,182,156, Cl. 73-35.000.

Little Giant Industries Inc.: *See*—
Wing, Harold R., 4,182,431, Cl. 182-23.000.

Little, Keith W.: *See*—
Millar, Barry C.; and Little, Keith W., 4,182,206, Cl. 83-56.000.

Liu, Hsing-Ching; and Liu, Lan-dih. Educational toy. 4,182,052, Cl. 35-9.00R.

Liu, Lan-dih: *See*—
Liu, Hsing-Ching; and Liu, Lan-dih, 4,182,052, Cl. 35-9.00R.

Livesay, Richard E.; and Wright, Paul L., to Caterpillar Tractor Co. Keeper assembly. 4,182,578, Cl. 403-317.000.

Ljung, Hans G., to Aktiebolaget Electrolux. Method and apparatus for defrosting a display refrigerator or freezer. 4,182,130, Cl. 62-82.000.

Lo, Grace Y-S.: *See*—
Tung, Lu H.; and Lo, Grace Y-S., 4,182,818, Cl. 526-173.000.

Locke, Philip F., Jr.: *See*—
Wolf, Joachim E.; and Locke, Philip F., Jr., 4,182,982, Cl. 324-127.000.

Logisticon, Inc.: *See*—
Blakeslee, Thomas R., 4,182,126, Cl. 60-459.000.

Lombana, Luis A.; and Campos, Jose G., to Envirotech Corporation. Incineration method and system. 4,182,246, Cl. 110-188.000.

Longenecker, Lineaus W. Greeting card. 4,182,060, Cl. 40-124.100.

Longo, Joseph T.: *See*—
Wang, Cheng-Chi; Pasko, John G.; Longo, Joseph T.; and Clarke, John E., 4,183,035, Cl. 357-30.000.

Look S.A.: *See*—
Beyl, Jean A. J., 4,182,524, Cl. 280-618.000.

Looker, Ivan L. Navigation device for aircraft navigation. 4,182,171, Cl. 73-178.00R.

Lord Corporation: *See*—
McGuire, Dennis P., 4,182,138, Cl. 64-11.00R.

Loshaek, Samuel; and Shen, Chah M. Hydrophilic polymers and contact lenses of high water content. 4,182,802, Cl. 526-264.000.

Loveland, Winton S.: *See*—
Warshaw, Saul; and Loveland, Winton S., 4,182,223, Cl. 93-36.900.

Lovewell, Jack S., to Shell Container Systems. Container and cabinet therefor. 4,182,476, Cl. 229-17.00B.

Lowrey, Ernest E.: *See*—
Wise, Charles D.; Lowrey, Ernest E.; Lowrey, Oliver W.; Williams, Thomas R.; and Neeley, Price, 4,182,054, Cl. 35-17.000.

Lowrey, Oliver W.: *See*—
Wise, Charles D.; Lowrey, Ernest E.; Lowrey, Oliver W.; Williams, Thomas R.; and Neeley, Price, 4,182,054, Cl. 35-17.000.

Ludke, Heimo, to Bayer Aktiengesellschaft. Process for the production of rapid-set moldings. 4,182,826, Cl. 528-57.000.

Ludlow, Roger D.; and Rieker, Charles M. Electronic level and protractor. 4,182,046, Cl. 33-366.000.

Luebke, Delbert R.: *See*—
Ramsay, Anne B.; Luebke, Delbert R.; Guzek, David T.; Hsieh, Chia-Lung; Roteman, Robert; and Leathem, William D., 4,182,756, Cl. 424-180.000.

Lukas, Helmut H.; and Dalgleish, Jack F., to Northern Telecom Limited. Multiple connector for optical fibres. 4,182,546, Cl. 350-96.210.

Lundell, Robert C. Exercise shoe sit-up apparatus. 4,182,510, Cl. 272-93.000.

Luthringer, Jean: *See*—
Combette, Marc; and Luthringer, Jean, 4,182,218, Cl. 85-84.000.

Lvov, Sergei L.: *See*—
Sinelnikov, Alexandr V.; Patushinskaya, Raisa S.; Freidgeim, Lazar I.; Bizev, Anatoly A.; Druzhkova, Larisa M.; Salimov, Vyacheslav K.; Lebedich, Sergei P.; Lvov, Sergei L.; Minkina, Margarita E.; Shurygin, Alexandr P.; Levin, Valery S.; Faradzh-Zade, Solmaz A.; Lebedev, Igor V., deceased; and Lebedeva, Marina I., administrator, 4,182,358, Cl. 137-115.000.

Lynch, Patrick J.: *See*—
Brindle, Dannie K.; and Shanfelt, Donald Y., 4,182,307, Cl. 126-432.000.

Lynch, Richard W.; and Dotson, Ronald L., to Olin Corporation. Electrochemical production of available chlorine containing organic compounds in a divided cell. 4,182,661, Cl. 204-78.000.

Lynch, Thomas J.; and Rowatt, Robert J., to Gulf Oil Corporation. Stereospecific olefin polymerization processes. 4,182,817, Cl. 526-169.000.

Lyons, James E., to Sun Ventures, Inc. Ion-exchanged transition metal catalysts for the direct oxidation of olefins to epoxyalcohols. 4,182,722, Cl. 260-348.330.

Mabuchi, Shunsuke; Kumoi, Sadakatsu; and Tsuzuki, Kenji, to Toyo Soda Manufacturing Co., Ltd. Process for reaction in catalyst suspension system. 4,182,919, Cl. 568-861.000.

MAC Valves, Inc.: *See*—
Neff, James A., 4,182,360, Cl. 137-270.000.

MacCleary, Randall C.; and Thaman, Ronald N., to SEA Investigation Division, Inc. Methods for use in fire investigation. 4,182,959, Cl. 250-492.00R.

MacFadden, John A.; and Ramsey, James E., to Westinghouse Electric Corp. Magnetic damping assembly with temperature compensator for watthour meters. 4,182,984, Cl. 324-152.000.

Maeda, Hiroshi; Kanamaru, Ryunosuke; and Ishida, Nakao, to Kayaku Antibiotic Research Co., Ltd. Neocarzinostatin derivatives and a process for producing the same. 4,182,752, Cl. 424-78.000.

Magid, Donni; and Magid, Zelig Z. Pre-programmable obstacle positioning electronic game. 4,182,514, Cl. 273-237.000.

Magid, Zelig Z.: *See*—
Magid, Donni; and Magid, Zelig Z., 4,182,514, Cl. 273-237.000.

Mahaska Industries, Inc.: *See*—
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., 4,182,271, Cl. 119-28.000.

Mahler, Gerhard: *See*—
Dickopp, Gerald; Mahler, Gerhard; and Scholz, Werner, 4,183,043, Cl. 358-11.000.

Main, William F.: *See*—
Johnson, Clark E., Jr.; and Main, William F., 4,183,028, Cl. 346-35.000.

Makino, Kenya; Komatsu, Koei; Takeuchi, Yasumasa; and Endo, Masayuki, to Japan Synthetic Rubber Co., Ltd. Process for the preparation of 1,2-polybutadiene. 4,182,813, Cl. 526-92.000.

Makishima, Tukuo: *See*—
Ueno, Hiroshi; Inaba, Naomi; Makishima, Tukuo; Watanabe, Koh; and Wada, Shozo, 4,182,691, Cl. 252-429.00B.

Maklad, Mokhtar S.; Sigel, George H., Jr.; and Bickel, Gary W., to International Telephone and Telegraph Corporation. Radiation hardness of optical fibers. 4,182,664, Cl. 204-157.10H.

Mandel, Harvey B.: *See*—
Huck, Charles M.; Ashley, Charles R.; Williams, Ina L.; and Mandel, Harvey B., 4,182,448, Cl. 206-380.000.

Mannesmann Aktiengesellschaft: *See*—
Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simoneit, Gunter; and Ries, Karl, 4,182,154, Cl. 73-1.0DV.
Steinberg, Hans; and Tepper, Volkmar, 4,182,200, Cl. 74-664.000.

Manufacture de Produits Chimiques Protex Societe Anonyme: *See*—
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Marathon Oil Company: *See*—
Presley, C. Travis; and Harrison, Rebecca J., 4,182,689, Cl. 252-330.000.

Marconi Company Limited, The: *See*—
Brooks, Seville R., 4,183,024, Cl. 343-5.0ST.

Maremont Corporation: *See*—
Pepi, Jerome S., 4,182,438, Cl. 188-322.000.

Margen, Peter H. E., to Aktiebolaget Atomenergi. Arrangement for transferring heat from the exhaust air leaving an enclosed volume to the input air supplied to said volume. 4,182,403, Cl. 165-12.000.

Marincic, Nikola: *See*—
Epstein, James; and Marincic, Nikola, 4,182,028, Cl. 29-623.200.

Marine Resources, Inc.: *See*—
Sims, Claude C., 4,183,017, Cl. 340-384.00R.

Mark, Victor; and Hedges, Charles V., to General Electric Company. Polycarbonate compositions having improved flame retardance and improved water vapor transmission. 4,182,838, Cl. 528-202.000.

Markert, Jurgen; and Morawietz, Hans, to Ciba-Geigy Corporation. Process for the production of pyranthrones or flavanthrones. 4,182,882, Cl. 546-31.000.

Markum, Thomas R.; and Bryson, Charles E., Jr., to Emerson Electric Co. Electric heating elements. 4,182,948, Cl. 219-541.000.

Marquardt, Richard: *See*—
Bosch, Manfred; and Marquardt, Richard, 4,182,045, Cl. 33-179.50D.

Marsh, Richard L.: *See*—
Tally, David N.; and Marsh, Richard L., 4,182,019, Cl. 29-453.000.

Marsh Stencil Machine Company: *See*—
Hill, Forrest G., 4,182,645, Cl. 156-361.000.

Marshall, Cary S.; and Steffanson, Robert S., to Dow Chemical Company, The. Non-solvent precipitation of polymer composition. 4,182,850, Cl. 528-480.000.

Marshall, Ralph C.; and Consoli, Ronald P. High efficiency air conditioner. 4,182,131, Cl. 62-91.000.

Martensson, Marten, to A B Servator. Firearm having two or more barrels. 4,182,064, Cl. 42-12.000.

Martensson, Marten, to A B Servator. Fire-arm. 4,182,065, Cl. 42-12.000.

Martin, Gerhard: *See*—
Behpour, Ahmad; Kayser, Detlev; and Martin, Gerhard, 4,182,770, Cl. 424-273.00R.

Martin, Michael R.: *See*—
Hartmann, Charles H.; and Martin, Michael R., 4,182,740, Cl. 422-54.000.
Martin, Robert B., to Petrolite Corporation. Plural stage desalter/dehydrator in a single vessel. 4,182,672, Cl. 204-302.000.
Martynova, Marina A.: *See*—
Bocharov, Jury N.; Kabanov, Viktor A.; Martynova, Marina A.; Popov, Valery G.; Smetanjuk, Vladimir I.; and Fedorov, Viktor V., 4,182,811, Cl. 526-69.000.
Maruhashi, Yoshitsugu: *See*—
Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,182,457, Cl. 215-1.00C.
Maruzen Sewing Machine Co., Ltd.: *See*—
Matumura, Nobuyoshi; and Tukioka, Kotohiko, 4,182,249, Cl. 112-158.00B.
Maschinenfabrik Peter Zimmer Aktiengesellschaft: *See*—
Zimmer, Peter; Kudlich, Hans; and Schweitzer, Karl, 4,182,660, Cl. 204-11.000.
Mashio, Tasuku: *See*—
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,182,793, Cl. 428-432.000.
Massa, Donald P.: *See*—
Massa, Frank, 4,183,011, Cl. 134-184.000.
Massa, Frank, to Dellorfano, Fred M., Jr.; and Massa, Donald P., Trustees of The Stoneleigh Trust u/d/t. Ultrasonic cleaning systems. 4,183,011, Cl. 134-184.000.
Massey-Ferguson Inc.: *See*—
Paul, David S., 4,182,456, Cl. 414-685.000.
Masuda, Takeshi: *See*—
Furukawa, Kazuo; Masuda, Takeshi; Nunotani, Masakatu; and Amano, Norio, 4,183,090, Cl. 364-900.000.
Masuda, Toshiyuki, to Sharp Kabushiki Kaisha. Electronic wristwatch employing a flexible film substrate. 4,182,115, Cl. 58-88.00R.
Masuya, Hirotomo: *See*—
Miki, Takuichi; Matsuo, Taisuke; Sugawara, Tohru; and Masuya, Hirotomo, 4,182,866, Cl. 544-27.000.
Matlin, Joel: *See*—
Lekhtman, Gregory, 4,183,019, Cl. 340-539.000.
Matrix Science Corporation: *See*—
Mattingly, William R., Jr., 4,182,542, Cl. 339-217.00S.
Matrullo, C. James. Anal filter. 4,182,335, Cl. 128-290.00R.
Matsui, Ryoji: *See*—
Fujii, Setsuro; Kawamura, Hiroyuki; Taira, Seizo; Matsui, Ryoji; Sakurai, Yojiro; and Okutome, Toshiyuki, 4,182,897, Cl. 560-19.000.
Matsumoto, Fuyuhiko: *See*—
Ohbori, Tamio; Matsumoto, Fuyuhiko; and Tomita, Satoru, 4,183,032, Cl. 346-155.000.
Matsuo, Kazumasa, to Olympus Optical Co., Ltd. Camera mounting device for an endoscope. 4,182,558, Cl. 354-62.000.
Matsuo, Taisuke: *See*—
Miki, Takuichi; Matsuo, Taisuke; Sugawara, Tohru; and Masuya, Hirotomo, 4,182,866, Cl. 544-27.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kondo, Shigeo; Yoshiike, Nobuyuki; and Fukai, Masakazu, 4,182,797, Cl. 429-191.000.
Murakami, Mutsuaki; and Yoshimura, Susumu, 4,183,006, Cl. 338-23.000.
Tomii, Kaoru; and Kohashi, Tadao, 4,183,053, Cl. 358-60.000.
Matsushita, Yoshihiro: *See*—
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Matsuyama, Kiyoshi: *See*—
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; and Suzuki, Takatoshi, 4,182,852, Cl. 528-494.000.
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Mattel, Inc.: *See*—
Gay, Derek J.; Wilson, Nicol S.; Sweet, Roger H.; and Berford, Saint E. B., 4,182,076, Cl. 46-265.000.
James, David F., 4,182,075, Cl. 46-118.000.
Matthews, Richard A.: *See*—
Gadbois, Richard T.; and Matthews, Richard A., 4,182,616, Cl. 51-295.000.
Mattingly, William R., Jr., to Matrix Science Corporation. Clipless contact. 4,182,542, Cl. 339-217.00S.
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McCauley, Margaret. Permanent denture plates and method of installing. 4,182,034, Cl. 433-174.000.
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McCormick, Harold E.; and Berkbigler, Roger L., to Ramsey Corporation. Retaining ring. 4,182,579, Cl. 403-326.000.
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McDaniel, Ralph H. Flotation garment. 4,181,993, Cl. 9-329.000.
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McNutt, Darrell A. Window tucker wheels. 4,182,103, Cl. 56-364.000.
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McWhirt, Bobby D.: *See*—
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Mele, Peter. Downdraft furnace. 4,182,304, Cl. 126-76.000.
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Mesia, Charles R., to Mesabi Jobbers, Inc. Blast hole liner. 4,182,242, Cl. 102-22.00R.
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Meyer, Jacques; and Bernelin, Daniel, to Rhone-Poulenc Industries. Cross-linkable saturated powderous compositions and powderous painting and coating compositions containing same. 4,182,840, Cl. 525-437.000.
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Michaels, Alan S., to Alza Corporation. Means for administering amphipathic medicament. 4,182,330, Cl. 128-260.000.
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Miller, Larry C. Head harness device. 4,182,322, Cl. 128-133.000.
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Mitchell, John W., Sr.; Oyama, Kenneth H.; Lawler, John K., deceased; and by Lawler, Doris G., executrix. Self contained pressure vessel. 4,182,238, Cl. 100-99.000.
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Murai, Hiromu; Enomoto, Hiroshi; Aoyagi, Yoshiaki; Yoshikuni, Yoshiaki; Yagi, Masahiro; and Shirahase, Ichiro, to Nippon Shinyaku Co., Ltd. Antihyperglycemic N-alkyl-3,4,5-trihydroxy-2-piperidine methanol. 4,182,767, Cl. 424-267.000.
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Murray, Larry C. Self-propelled irrigation apparatus. 4,182,493, Cl. 239-183.000.
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Muscatell, Ralph P. Variable airfoil assembly. 4,182,503, Cl. 244-219.000.
Muschiatti, Lawrence C.: *See—*
Briggs, Paul C., Jr.; and Muschiatti, Lawrence C., 4,182,644, Cl. 156-310.000.
Mushabac, David R. Dental probe. 4,182,312, Cl. 433-68.000.
Mutoh, Masayuki: *See—*
Kaieda, Shozo; Mutoh, Masayuki; and Kamimura, Kuniaki, 4,183,030, Cl. 346-140.00R.
Myint, Myo, to Atlantic Richfield Company. Carbon monoxide manufacture. 4,182,746, Cl. 423-415.00A.
Naeser, Helmut; and Mendisch, Norbert, to Siemens Aktiengesellschaft. Device for feeding fuser oil to the surface of a fixing roller. 4,182,263, Cl. 118-60.000.
Nagai, Haruo; Uehara, Hiroshi; and Nunokawa, Kunikazu, to Kyowa Gas Chemical Industry Co., Ltd. Method for producing a lead containing monomer composition and a radiation shielding polymer. 4,182,821, Cl. 526-240.000.
Nagase, Tsuneyuki: *See—*
Suzukamo, Gohu; and Nagase, Tsuneyuki, 4,182,906, Cl. 562-506.000.
Nagatani, Toshihiro: *See—*
Konishi, Kazunori; Wakayama, Hiromu; Nagatani, Toshihiro; and Eto, Fumio, 4,182,042, Cl. 33-18.00R.
Nagumo, Fumio: *See—*
Yamanaka, Seisuke; Nagumo, Fumio; and Nishimura, Toshimichi, 4,183,052, Cl. 358-50.000.
Nakajima, Yasuo; and Hayashi, Yoshimasa, to Nissan Motor Co., Limited. Variable valve timing system for internal combustion engine. 4,182,289, Cl. 123-90.160.
Nakamura, Akito: *See—*
Suzuki, Toshio; and Nakamura, Akito, 4,182,824, Cl. 528-15.000.
Nakamura, Masayoshi: *See—*
Kutaragi, Ken; and Nakamura, Masayoshi, 4,183,025, Cl. 324-103.00P.
Nakanishi, Kiyoshi: *See—*
Sato, Katsujiro; Nakanishi, Kiyoshi; and Okumura, Takeshi, 4,182,279, Cl. 123-30.00C.
Nakayama, Takao; Yamazaki, Chikayasu; and Ohno, Michio, to Toray Industries, Inc. Yarn tension meter. 4,182,167, Cl. 73-144.000.
Namizaki, Hirofumi; Susaki, Wataru; and Kan, Hirofumi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser device. 4,183,038, Cl. 357-17.000.
Narda Microwave Corporation: *See—*
Aslan, Edward E., 4,182,313, Cl. 128-736.000.
Narr, Berthold: *See—*
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; and Haarmann, Walter, 4,182,887, Cl. 546-119.000.
Naslund, Lars A.; and Laskin, Allen I. Modified heteropolysaccharides and their preparation. 4,182,860, Cl. 536-114.000.
Nasser, Gamal El Din; and Pocrnja, Anton, to Linde Aktiengesellschaft. Apparatus for the cooling and dehumidification of ambient air in regions having a hot and humid climate. 4,182,132, Cl. 62-93.000.
National Instrument Company, Inc.: *See—*
Buckley, Lawrence W.; and Bennett, Richard N., 4,182,387, Cl. 141-129.000.

National Research Development Corporation: *See—*
Bellhouse, Brian J., 4,182,653, Cl. 435-2.000.
Dickinson, Thomas; and Dobson, John V., 4,182,666, Cl. 204-195.00P.
Dobson, John V.; and Dickinson, Thomas, 4,182,667, Cl. 204-195.00M.
Hardwick, William H.; Wace, Peter F.; and Alder, Peter J., 4,182,627, Cl. 75-0.5AC.
Kidd, Samuel M., 4,183,078, Cl. 362-231.000.
Rees, Huw D., 4,183,033, Cl. 357-22.000.

National Semiconductor Corporation: *See—*
Cometta, Robert A., 4,182,024, Cl. 29-571.000.

National Starch and Chemical Corporation: *See—*
Schoenberg, Jules E., 4,182,823, Cl. 526-298.000.

Natsui, Ken-ichi: *See—*
Koyanagi, Osamu; Natsui, Ken-ichi; and Yoshioka, Yoshio, 4,182,942, Cl. 200-148.00A.

Naylor, Donald B. Sectionalized door for a barn or similar structure. 4,182,080, Cl. 49-410.000.

NCR Corporation: *See—*
Cohen, Jerome; and Chen, Peter C., 4,182,023, Cl. 29-571.000.
Ward, William P., 4,183,095, Cl. 365-189.000.

Neeley, Price: *See—*
Wise, Charles D.; Lowrey, Ernest E.; Lowrey, Oliver W.; Williams, Thomas R.; and Neeley, Price, 4,182,054, Cl. 35-17.000.

Neff, James A., to MAC Valves, Inc. Pressure regulating and flow control valve. 4,182,360, Cl. 137-270.000.

Nelbock-Hochstetter, Michael: *See—*
Horn, Jurgen; Albert, Winfried; Batz, Hans-Georg; and Nelbock-Hochstetter, Michael, 4,182,695, Cl. 260-6.000.

Nelson, Charles J., to United Technologies Corporation. Turbine blade damper. 4,182,598, Cl. 416-193.00A.

Nelson, Dana W., to Carrier Corporation. Tube cleaning apparatus. 4,181,998, Cl. 15-104.140.

Nelson, Donald R.: *See—*
Grandin, Hartley F., Jr.; and Nelson, Donald R., 4,182,372, Cl. 137-625.400.

Nelson, Frank M.: *See—*
Daughton, John W.; Gillett, Kenneth; and Nelson, Frank M., 4,183,089, Cl. 364-900.000.

Nemeth, Joseph J. Mathematical gameboard. 4,182,515, Cl. 273-237.000.

Nemoto, Yoshio. Drawing instrument for an ellipse. 4,182,043, Cl. 33-31.000.

Neumeier, Robert G. Telephone supporting set. 4,182,938, Cl. 179-147.000.

Newbould, Gilbert J.: *See—*
Burkart, Robert C.; and Newbould, Gilbert J., 4,182,588, Cl. 408-14.000.

Newport, Duane B. Combination fork device. 4,182,032, Cl. 30-137.000.

Newton, Roger E.: *See—*
Casten, George P.; McKinney, Gordon R.; Newton, Roger E.; Tompkins, E. Crosby; and Weikel, John H., Jr., 4,182,763, Cl. 424-251.000.

NGK Insulators, Ltd.: *See—*
Kaneno, Masayuki; Oda, Isao; and Yamamoto, Noboru, 4,182,972, Cl. 313-221.000.

Nichols, John A.: *See—*
Davis, Wilbur M.; Sawyer, Bobby G.; and Nichols, John A., 4,182,099, Cl. 56-16.400.

Nickel, Friedhelm: *See—*
Koerner, Gotz; Schmidt, Gunter; and Nickel, Friedhelm, 4,182,682, Cl. 252-8.600.

Nickl, Josef: *See—*
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; and Haarmann, Walter, 4,182,887, Cl. 546-119.000.

Nickson, Kenneth L. Surgical instrument for performing emergency tracheotomies. 4,182,337, Cl. 128-305.300.

Niebylski, Leonard M., to Ethyl Corporation. Exhaust systems. 4,182,120, Cl. 60-274.000.

Niedecker, Herbert. Wire closure clip. 4,182,015, Cl. 29-243.560.

Nieh, Edward C. Y.; and Speranza, George P., to Texaco Development Corporation. Triethylenediamine process. 4,182,864, Cl. 544-352.000.

Nielsen, Ralph H.; and Payton, Patrick H., to Teledyne Industries, Inc. Extracting columbium-tantalum values from pyrochlore ores. 4,182,744, Cl. 423-68.000.

Nielsen, Randy R.: *See—*
Green, Sidney J.; and Nielsen, Randy R., 4,182,215, Cl. 85-32.00T.

Nijman, John P., to Bunker Ramo Corporation. Conductor terminating apparatus. 4,182,029, Cl. 29-749.000.

Nilsson, Bernt, to Forsheda Gummifabrik AB. Device for dispensing a liquid flowing through a substantially vertical tube. 4,182,376, Cl. 137-874.000.

Nilsson, Kenth; Hoek, Bertil; Ohlsson, Thomas; and Bjelkhagen, Hans, to Siemens Aktiengesellschaft. Holographic installation. 4,182,316, Cl. 128-665.000.

Nilsson, Nils-Inge: *See—*
Lagerstrom, Gosta B.; and Nilsson, Nils-Inge, 4,182,780, Cl. 426-636.000.

Nippon Electric Co., Ltd.: *See—*
Murakami, Masatoshi, 4,182,988, Cl. 325-41.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Nishimoto, Tetsuo, 4,182,210, Cl. 84-1.010.
Sigeki, Isii, 4,182,212, Cl. 84-1.030.

Nippon Oil Company Limited: *See—*
Imsizumi, Masao, 4,182,914, Cl. 568-697.000.
Takezono, Tetsuya; and Fujiwara, Yasuo, 4,182,913, Cl. 568-697.000.
Yagi, Osami; and Fujiwara, Yasuo, 4,182,765, Cl. 424-263.000.

Nippon Paint Co., Ltd.: *See—*
Mibu, Hiroaki; Ishihara, Tadashi; Tanaka, Chiaki; and Esaki, Shingo, 4,182,665, Cl. 204-159.150.

Nippon Shinyaku Co., Ltd.: *See—*
Murai, Hiromu; Enomoto, Hiroshi; Aoyagi, Yoshiaki; Yoshikuni, Yoshiaki; Yagi, Masahiro; and Shirahase, Ichiro, 4,182,767, Cl. 424-267.000.

Niro Atomizer A/S: *See—*
Moller, Jens C. T., 4,182,871, Cl. 544-190.000.

Nishida, Fusao; Ueno, Toshihiro; Yamada, Tomiaki; Suzuki, Noriyuki; Takeda, Takehiko; Yanagihara, Tsutomu; Adachi, Katsuhiko; Asanabe, Tadashi; Ohsato, Katsuaki; Tsuda, Kintaro; and Watanabe, Keiichiro, to JGC Corporation. Catalyst for reducing nitrogen oxides in a waste gas and a process for catalytically reducing nitrogen oxides contained in a waste gas. 4,182,745, Cl. 423-239.00A.

Nishikawa, Masayasu: *See—*
Yagi, Shizuo; Fujii, Isao; and Nishikawa, Masayasu, 4,182,285, Cl. 123-75.00B.
Yagi, Shizuo; Fujii, Isao; and Nishikawa, Masayasu, 4,182,287, Cl. 123-75.00B.

Nishimoto, Tetsuo, to Nippon Gakki Seizo Kabushiki Kaisha. Keying system for an electronic musical instrument. 4,182,210, Cl. 84-1.010.

Nishimura, Toshimichi: *See—*
Yamanaka, Seisuke; Nagumo, Fumio; and Nishimura, Toshimichi, 4,183,052, Cl. 358-50.000.

Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, to Murata Manufacturing Co., Ltd. Piezoelectric crystalline film of zinc oxide. 4,182,793, Cl. 428-432.000.

Nissan Motor Company, Inc.: *See—*
Endo, Hiroshi; and Baba, Kosaku, 4,182,989, Cl. 325-53.000.

Nissan Motor Co., Limited: *See—*
Anzai, Makoto; and Hosaka, Akio, 4,182,292, Cl. 123-119.0EC.
Kita, Toru, 4,182,165, Cl. 73-194.0VS.
Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,182,289, Cl. 123-90.160.

Nolte, David G., to Texaco Inc. Method and apparatus for measuring a change in surface level of a liquid. 4,182,178, Cl. 73-299.000.

Nomura, Junji: *See—*
Kominami, Naoya; Fukumi, Hirokazu; Yamawaki, Naokuni; Nomura, Junji; and Kayamori, Hiroshi, 4,182,267, Cl. 119-3.000.

Nordson Corporation: *See—*
Kennon, James L., 4,182,490, Cl. 239-3.000.

Norell, John R.: *See—*
Fozzard, George B.; and Norell, John R., 4,182,901, Cl. 560-262.000.

Norgate, Peter: *See—*
Green, Malcolm L. H.; and Norgate, Peter, 4,182,742, Cl. 422-199.000.

Norman, Richard O.: *See—*
Parke, James G.; Norman, Richard O.; Colle, Edward D.; and Fussell, Edsel M., 4,182,491, Cl. 239-11.000.

Nortene: *See—*
Casaert, Rene; and Pavy, Michel, 4,182,738, Cl. 264-210.200.

North American Laboratories, Inc.: *See—*
Etes, Donald E., 4,182,478, Cl. 229-62.000.

Northern Telecom Limited: *See—*
Lukas, Helmut H.; and Dalgleish, Jack F., 4,182,546, Cl. 350-96.210.

Norton Company: *See—*
Kiovsky, Joseph R.; and Goyette, William J., 4,182,692, Cl. 252-455.00Z.

Novak, Petr; Pellant, Jaroslav; Zuna, Jaroslav; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel. Power semiconductor device. 4,183,042, Cl. 357-82.000.

Novi-P.B.: *See—*
Benezech, Jacques, 4,182,027, Cl. 29-598.000.

NPI Corporation: *See—*
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,182,231, Cl. 99-387.000.

Nunn, Barbara; and Baggaley, Keith H., to Beecham Group Limited. Prophylaxis or treatment of thromboses and inhibition of platelet aggregation in human blood. 4,182,768, Cl. 424-267.000.

Nunokawa, Kunikazu: *See—*
Nagai, Haruo; Uehara, Hiroshi; and Nunokawa, Kunikazu, 4,182,821, Cl. 526-240.000.

Nunotani, Masakatu: *See—*
Furukawa, Kazuo; Masuda, Takeshi; Nunotani, Masakatu; and Amano, Norio, 4,183,090, Cl. 364-900.000.

Nusser, Hermann: *See—*
Greiner, Max; and Nusser, Hermann, 4,182,298, Cl. 123-139.0AW.

N.V. Industrieele Handelscombinatie Holland: *See—*
Bordes, Kees, 4,182,253, Cl. 114-72.000.

Oakey, Edwin J., to Hydra-Guard Corporation. Fire hydrant protection device. 4,182,361, Cl. 137-296.000.

O'Brien, Theodore E., to Candu Packing (Ontario) Limited. Method and apparatus for stacking batts in compressible columns. 4,182,237, Cl. 100-35.000.

Ochiai, Michihiko; Morimoto, Akira; Matsushita, Yoshihiro; Aki, Osami; Okada, Taiiti; and Kawakita, Kenji, to Takeda Chemical Industries, Ltd. 7-Methoxycephalosporin derivatives. 4,182,868, Cl. 544-21.000.

Oda, Isao: *See*—
Kaneno, Masayuki; Oda, Isao; and Yamamoto, Noboru, 4,182,972, Cl. 313-221.000.

O'Dwyer, Michael F.; Feroce, John J.; and Jones, David A., to Dracket Company, The. Mop swivel connector. 4,182,577, Cl. 403-74.000.

Ogata, Yuzuru; Fukuhara, Toshio; and Araki, Shigeru, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Composition for inhibiting the growth of plants. 4,182,621, Cl. 71-76.000.

Ogawa, Toshio: *See*—
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,182,793, Cl. 428-432.000.

Ogle, Robert W., to IMS Limited. Laryngotracheal syringe. 4,182,326, Cl. 128-220.000.

Oguchi, Masanobu; Ishikawa, Hidehiko; Okuyama, Haruyoski; Uchida, Yasuo; and Izawa, Kiyoshi, to Konishiroku Photo Industry Co. Ltd. Color printing method. 4,182,560, Cl. 354-106.000.

Ohbori, Tamio; Matsumoto, Fuyuhiko; and Tomita, Satoru, to Ricoh Co., Ltd. Electrostatic recording medium with elongated conductive segments. 4,183,032, Cl. 346-155.000.

Ohlsson, Thomas: *See*—
Nilsson, Kenth; Hoek, Bertil; Ohlsson, Thomas; and Bjelkhagen, Hans, 4,182,316, Cl. 128-665.000.

Ohno, Michio: *See*—
Nakayama, Takao; Yamazaki, Chikayasu; and Ohno, Michio, 4,182,167, Cl. 73-144.000.

Ohsato, Katsuaki: *See*—
Nishida, Fusao; Ueno, Toshihiro; Yamada, Tomiaki; Suzuki, Noriyuki; Takeda, Takehiko; Yanagihara, Tsutomu; Adachi, Katsuhiko; Asanabe, Tadashi; Ohsato, Katsuaki; Tsuda, Kintaro; and Watanabe, Keiichiro, 4,182,745, Cl. 423-239.00A.

Ohta, Yutaka: *See*—
Tada, Yasuyuki; and Ohta, Yutaka, 4,182,036, Cl. 433-2.000.

Ohya, Tadahiko: *See*—
Kato, Kiyotaka; and Ohya, Tadahiko, 4,182,021, Cl. 29-568.000.

Okada, Taiiti: *See*—
Ochiai, Michihiko; Morimoto, Akira; Matsushita, Yoshihiro; Aki, Osami; Okada, Taiiti; and Kawakita, Kenji, 4,182,868, Cl. 544-21.000.

Okumura, Takeshi: *See*—
Sato, Katsujiro; Nakanishi, Kiyoshi; and Okumura, Takeshi, 4,182,279, Cl. 123-30.00C.

Okutome, Toshiyuki: *See*—
Fujii, Setsuro; Kawamura, Hiroyuki; Taira, Seizo; Matsui, Ryoji; Sakurai, Yojiro; and Okutome, Toshiyuki, 4,182,897, Cl. 560-19.000.

Okuyama, Haruyoski: *See*—
Oguchi, Masanobu; Ishikawa, Hidehiko; Okuyama, Haruyoski; Uchida, Yasuo; and Izawa, Kiyoshi, 4,182,560, Cl. 354-106.000.

Olander, Roland J., to Miner Enterprises, Inc. Railroad car hand brake. 4,182,197, Cl. 74-505.000.

Olin Corporation: *See*—
Lynch, Richard W.; and Dotson, Ronald L., 4,182,661, Cl. 204-78.000.
Popplewell, James M., 4,182,399, Cl. 165-1.000.

Olympus Optical Co., Ltd.: *See*—
Koshiishi, Kiyozo; and Mizusaki, Takashi, 4,182,668, Cl. 204-195.00L.
Matsuo, Kazumasa, 4,182,558, Cl. 354-62.000.

Omori, Shouji: *See*—
Tsuchiya, Takao; Omori, Shouji; Kuniyoshi, Yasunobu; Matsuzaki, Atsushi; Akazawa, Susumu; and Tominaga, Kiyonori, 4,183,050, Cl. 358-34.000.

Omoto, Naoichi: *See*—
Miyamura, Akio; Kusumi, Yukio; and Omoto, Naoichi, 4,182,894, Cl. 548-352.000.

Oneyama, Naotake: *See*—
Fukano, Yoshihiro; and Oneyama, Naotake, 4,182,375, Cl. 137-625.690.

Onishi, Wataru: *See*—
Kamiwaki, Osamu; and Onishi, Wataru, 4,182,110, Cl. 58-23.0BA.

Ono, Hironobu; and Bito, Minoru, to Toyota Judosha Kogyo Kabushiki Kaisha. Trouble warning device for an air-fuel ratio sensor. 4,182,300, Cl. 123-198.00D.

Ono, Tomoyoshi: *See*—
Suzuki, Hideaki; Ono, Tomoyoshi; Yamamoto, Wataru; and Yamaguchi, Masahiro, 4,182,690, Cl. 252-358.000.

Ono, Yuichi: *See*—
Aoki, Masaaki; Ono, Yuichi; Morioka, Makoto; Ito, Kazuhiro; Mori, Mitshiuro; and Kurata, Kazuhiro, 4,183,039, Cl. 357-17.000.

O'Reagan, James R., to Eastman Kodak Company. Shutter release mechanism. 4,182,566, Cl. 354-268.000.

Ornstein, Leonard. Method of controlling the relative humidity in a soil environment and apparatus for accomplishing same. 4,182,357, Cl. 137-1.000.

Oros Company: *See*—
de Nevers, Noel H., 4,182,400, Cl. 165-1.000.
Gardner, James H., 4,182,128, Cl. 60-652.000.

O'Rourke, James L. Water-powered toothbrush with dentifrice attachment. 4,181,997, Cl. 15-24.000.

Orrey, Robert D. Tube squeezer. 4,182,464, Cl. 222-98.000.

Ortho Pharmaceutical Corp.: *See*—
Chen, Robert H. K., 4,182,717, Cl. 260-333.000.

Ortiz, Nilson V. Airborne toy. 4,182,074, Cl. 46-86.00R.

Osipovsky, Lev F.: *See*—
Zubarev, Anatoly I.; Osipovsky, Lev F.; and Shipov, Stanislav V., 4,182,421, Cl. 173-105.000.

Oster, Clarence, to Conoco, Inc. Anti-friction sucker rod guide assembly. 4,182,537, Cl. 308-4.00A.

Otis Engineering Corporation: *See*—
Churchman, Ronald K., 4,182,159, Cl. 73-40.50R.

Otrhalek, Joseph V.; Ajluni, Raymond M.; and Gomes, Gilbert S., to BASF Wyandotte Corporation. Post phosphating inhibiting rinse. 4,182,637, Cl. 148-6.14R.

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See*—
Ogata, Yuzuru; Fukuhara, Toshio; and Araki, Shigeru, 4,182,621, Cl. 71-76.000.

Owens-Corning Fiberglas Corporation: *See*—
Cottrell, Walter D., Jr.; and Lawson, Ernest E., 4,182,701, Cl. 260-38.000.

Ownby, James C.: *See*—
Irick, Gether, Jr.; Ownby, James C.; and Wang, Richard H. S., 4,182,703, Cl. 260-45.8RW.

Oyama, Kenneth H.: *See*—
Mitchell, John W., Sr.; Oyama, Kenneth H.; Lawler, John K., deceased; and Lawler, Doris G., executrix, 4,182,238, Cl. 100-99.000.

Ozeki, Masakatsu: *See*—
Tsujihara, Kenji; Ozeki, Masakatsu; and Arai, Yoshihisa, 4,182,757, Cl. 424-180.000.

Paige Company Containers, Inc., The: *See*—
Paige, Richard E., 4,182,477, Cl. 229-37.00R.

Paige, Richard E., to Paige Company Containers, Inc., The. Collapsible carton. 4,182,477, Cl. 229-37.00R.

Palau. Joseph, to Societe Anonyme des Etablissments Staubli. Dobbies for weaving looms. 4,182,380, Cl. 139-68.000.

Palmer, Richard C., to RCA Corporation. Track skipper for a video disc player. 4,183,059, Cl. 358-128.000.

Panametrics, Inc.: *See*—
Fowler, Kenneth A., 4,182,155, Cl. 73-1.0DV.

Panicker, Narayana N.; Hettinger, Fredric L.; and Jones, Darrell L., to Mobil Oil Corporation. Marine production riser system and method of installing same. 4,182,584, Cl. 405-195.000.

Pantukh, Boris T.: *See*—
Borgardt, Valentina J.; Volodin, Jury I.; Shalimova, Zoya S.; Pantukh, Boris T.; Egoricheva, Sofya A.; Rutman, Grigory I.; and Michurov, Jury I., 4,182,921, Cl. 568-750.000.

Papadofrangakis, Emmanuel; Fakiris, John A.; and Engeler, William E., to General Electric Company. Duplex ultrasonic imaging system with repetitive excitation of common transducer in doppler modality. 4,182,173, Cl. 73-194.00A.

Papanu, Victor D.: *See*—
Crutchfield, Marvin M.; Papanu, Victor D.; and Upton, Charles J., 4,182,900, Cl. 560-180.000.

Papendick, Uwe: *See*—
Funk, Gerhard; Weller, Eberhard; Renovanz, Hans-Dietrich; and Papendick, Uwe, 4,182,183, Cl. 73-362.0AR.

Parekh, Bhupendra K.: *See*—
Goldberger, William M.; Parekh, Bhupendra K.; and Faulkner, Bobby P., 4,182,498, Cl. 241-24.000.

Parke, James G.; Norman, Richard O.; Colle, Edward D.; and Fussell, Edsel M., to Micro-Gen Equipment Corp. Remote control spraying apparatus. 4,182,491, Cl. 239-11.000.

Parker, Edward I. Test, control and gauging method using locked oscillators. 4,182,986, Cl. 324-236.000.

Parkinson, Bruce A.: *See*—
Heller, Adam; Miller, Barry; and Parkinson, Bruce A., 4,182,796, Cl. 429-111.000.

Paschke, Edward E.: *See*—
Fields, Ellis K.; Cerefice, Steven A.; and Paschke, Edward E., 4,182,847, Cl. 528-361.000.

Pasko, John G.: *See*—
Wang, Cheng-Chi; Pasko, John G.; Longo, Joseph T.; and Clarke, John E., 4,183,035, Cl. 357-30.000.

Pate, Michelle D.: *See*—
Fujiwara, Edward J.; and Pate, Michelle D., 4,182,898, Cl. 560-26.000.

Patisaul, Charles R.; McDevitt, Fred R.; Tarmain, Edwin R.; and Monteith, Donald G., to Harris Corporation. Digital, frequency-translated, plural-channel, vestigial sideband television communication system. 4,183,054, Cl. 358-86.000.

Patitsas, George P.: *See*—
Larson, William M.; Patitsas, George P.; and Roennau, Raymond B., 4,182,393, Cl. 152-353.00R.

Patterson, Robert W.: *See*—
Wichman, William J.; and Patterson, Robert W., 4,182,494, Cl. 239-230.000.

Patushinskaya, Raisa S.: *See*—
Sinelnikov, Alexandr V.; Patushinskaya, Raisa S.; Freidgeim, Lazar I.; Bizev, Anatoly A.; Druzhkova, Larisa M.; Salimov, Vyacheslav K.; Lebedich, Sergei P.; Lvov, Sergei L.; Minkina, Margarita E.; Shurygin, Alexandr P.; Levin, Valery S.; Faradzh-Zade, Solmaz A.; Lebedev, Igor V., deceased; and Lebedeva, Marina I., administrator, 4,182,358, Cl. 137-115.000.

Paul, David S., to Massey-Ferguson Inc. Material handling machine. 4,182,456, Cl. 414-685.000.

Paul, Edwin H., Jr.: *See*—
Agrawala, Ashok K.; Kulkarni, Ashok V.; and Paul, Edwin H., Jr., 4,183,013, Cl. 340-146.3AC.

Pauwels, Edward M., to Bendix Corporation, The. Adaptive braking modulator valve. 4,182,536, Cl. 303-115.000.
Pavy, Michel: *See—*
Casaert, Rene; and Pavy, Michel, 4,182,738, Cl. 264-210.200.
Payton, Patrick H.: *See—*
Nielsen, Ralph H.; and Payton, Patrick H., 4,182,744, Cl. 423-68.000.
Pedersen, Peter C. Clearing of retained liquids from recesses in thin walled members. 4,182,151, Cl. 72-325.000.
Pedersen, Vernon G., to Dacor Corporation. Breathing apparatus. 4,182,323, Cl. 128-204.250.
Peekna, Andres, to W. R. Grace & Co. Contactless turning guide for running webs. 4,182,472, Cl. 226-97.000.
Pellant, Jaroslav: *See—*
Novak, Petr; Pellant, Jaroslav; Zuna, Jaroslav; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,183,042, Cl. 357-82.000.
Penny, William, to Hancock Laboratories, Inc. Heart valve holder. 4,182,446, Cl. 206-205.000.
Peonski, Edward, to American Gage & Machine Company. Gauging device for tapered rollers or the like. 4,182,044, Cl. 33-174.00L.
Pepi, Jerome S., to Maremont Corporation. Shock absorber with improved compression valve assembly. 4,182,438, Cl. 188-322.000.
Permavision: *See—*
Covington, William S., 4,182,723, Cl. 260-37.0SB.
Perri, Santo, to American Cyanamid Company. Eyed needle converted from a drilled end or channel end needle. 4,182,341, Cl. 128-339.000.
Peterson, Maurice L. Feeding apparatus. 4,182,273, Cl. 119-51.500.
Petrillo, James R.: *See—*
Hong, Paul O.; Petrillo, James R.; Friel, Teresa L.; and Witenhafer, Donald E., 4,182,809, Cl. 526-62.000.
Petrolite Corporation: *See—*
Martin, Robert B., 4,182,672, Cl. 204-302.000.
Thompson, Neil E. S., 4,182,705, Cl. 260-45.90R.
Pfister, Charles W.; and Pfister, Charles W., Jr. Fish lure. 4,182,067, Cl. 43-42.220.
Pfister, Charles W., Jr.: *See—*
Pfister, Charles W.; and Pfister, Charles W., Jr., 4,182,067, Cl. 43-42.220.
Pfizer Inc.: *See—*
Sciavolino, Frank C., 4,182,857, Cl. 536-9.000.
Sciavolino, Frank C., 4,182,858, Cl. 536-9.000.
Pfleiderer, Hans, to Siemens Aktiengesellschaft. Semiconductor device having two intersecting sub-diodes and transistor-like properties. 4,182,965, Cl. 307-299.00R.
Philip Morris Incorporated: *See—*
Rainer, Norman B.; and Feins, Irvin R., 4,182,743, Cl. 422-211.000.
Phillips, Donald L., to Dixie Bronze Company. Electrode holders having differential clamping devices. 4,182,927, Cl. 13-16.000.
Phillips, John N.: *See—*
Harris, Roger L. N.; Huppatz, John L.; Phillips, John N.; and Witrzens, Barbara, 4,182,877, Cl. 544-172.000.
Phillips Petroleum Company: *See—*
Chapman, Charles C., 4,182,924, Cl. 585-712.000.
Chapman, Charles C., 4,182,925, Cl. 585-719.000.
Fozzard, George B.; and Norell, John R., 4,182,901, Cl. 560-262.000.
Giles, Richard F., 4,182,954, Cl. 250-308.000.
Gunnell, Thomas J., 4,182,736, Cl. 264-117.000.
McDaniel, Max P.; and Welch, Melvin B., 4,182,815, Cl. 526-96.000.
Swindell, Harold J., 4,182,657, Cl. 203-2.000.
Trantham, Joseph C.; and Meldau, Robert F., 4,182,416, Cl. 166-245.000.
Willcox, Kenneth W., 4,182,810, Cl. 526-64.000.
Phillips, William D.: *See—*
Vaill, Ronald E.; and Phillips, William D., 4,182,152, Cl. 72-393.000.
Piccardi, Paolo; Confalonieri, Giovanni; Ramella, Pier G.; and Da Col, Lino, to Montedison S.p.A. Anthelmintic benzimidazol-carbamates. 4,182,893, Cl. 424-273.00B.
Pierce Chemical Company: *See—*
Royer, Garfield P., 4,182,654, Cl. 195-4.000.
Pignocco, Arthur J.; and Waitlevertch, Michael E., to United States Steel Corporation. Method for improving the adhesion of brass-coated steel cord to rubber. 4,182,639, Cl. 148-6.170.
Pilgrim Engineering Developments Limited: *See—*
Bunyan, Thomas W., 4,182,518, Cl. 277-65.000.
Pilkington Glass Industries Limited: *See—*
Clark, Donald G.; and Preston, Anthony, 4,182,575, Cl. 356-430.000.
Pillsbury Company, The: *See—*
Reid, Francis R., deceased, 4,182,225, Cl. 93-80.000.
Pinnell, Carrell I.; and Merting, John W. Supplemental heating and cooling system. 4,182,401, Cl. 165-2.000.
Piqua Engineering, Inc.: *See—*
Greer, Charles H., 4,182,236, Cl. 100-8.000.
Plank, Don A.: *See—*
Floyd, Joseph C.; and Plank, Don A., 4,182,725, Cl. 260-45.85S.
Playfoot, Kerwin C.; and Todt, William H., to Westinghouse Electric Corporation. Liquid level sensor with improved linearity. 4,182,176, Cl. 73-290.00R.
Pocrnja, Anton: *See—*
Nasser, Gamal El Din; and Pocrnja, Anton, 4,182,132, Cl. 62-93.000.
Pohle, William A. Variable ratio rocker arm. 4,182,290, Cl. 123-90.390.
Poisson, Norman D.: *See—*
Jacobson, Chester F.; and Poisson, Norman D., 4,182,033, Cl. 30-169.000.
Polaroid Corporation: *See—*
Biber, Conrad H.; Shenk, Edwin K.; and Tam, Shirley Y., 4,182,563, Cl. 354-197.000.
Driscoll, John J.; and Gold, Nicholas, 4,182,559, Cl. 354-105.000.
Foley, James W., 4,182,912, Cl. 568-649.000.
Haas, Howard C.; and Moreau, Robert D., 4,182,805, Cl. 525-336.000.
Land, Edwin H.; and Biber, Conrad H., 4,182,561, Cl. 354-145.000.
Pollet, Jean-Pierre, to Societe d'Etudes de Machines Thermiques S.E.M.T. Mushroom valve housing with fluid coolant circulation for internal combustion engines. 4,182,282, Cl. 123-41.760.
Pollock, Simon D. A.: *See—*
Baskeyfield, Lewis J.; Bell, John D.; Townend, John; and Pollock, Simon D. A., 4,182,916, Cl. 568-734.000.
Polycraft Corporation: *See—*
Bruno, Edward C.; and Reeme, Harvey D., 4,182,208, Cl. 83-118.000.
Poncin, Andre, to Poncin, Andre. Teeth of buckets for mechanical and hydraulic shovels. 4,182,058, Cl. 37-142.00A.
Pondell, Ralph E.: *See—*
Hall, Harlan S.; and Pondell, Ralph E., 4,182,778, Cl. 426-72.000.
Pongracz, Endre, to SAPAL, Societe Anonyme des Plieuses Automatiques. Handling process for staging manufactured articles. 4,182,443, Cl. 198-460.000.
Pool, Sam L.: *See—*
Evans, James D.; and Pool, Sam L., 4,183,056, Cl. 358-108.000.
Poole, William, to Moore Business Forms, Inc. Business forms stationery assembly. 4,182,526, Cl. 282-21.00R.
Popov, Valery G.: *See—*
Bocharov, Jury N.; Kabanov, Viktor A.; Martynova, Marina A.; Popov, Valery G.; Smetanjuk, Vladimir I.; and Fedorov, Viktor V., 4,182,811, Cl. 526-69.000.
Popplewell, James M., to Olin Corporation. Process for removing heavy metal ions from aqueous fluids. 4,182,399, Cl. 165-1.000.
Population Research Incorporated: *See—*
Bolduc, Lee R.; and Dickhudt, Eugene A., 4,182,328, Cl. 128-235.000.
Porter, Kenneth W.: *See—*
Albert, Albert A.; and Porter, Kenneth W., 4,182,492, Cl. 239-92.000.
Portz, Wilhelm: *See—*
Strauss, Georg; Portz, Wilhelm; Braun, Albert; Kandler, Joachim; Komorniczyk, Klaus; and Thiel, Hans-Dieter, 4,182,626, Cl. 75-58.000.
Porumbescu, Alexandra A., to Construction Specialties, Inc. Grille. 4,182,093, Cl. 52-663.000.
Posey, Donald L.: *See—*
Culotta, Randolph F.; and Posey, Donald L., 4,182,158, Cl. 73-40.000.
Potoski, John R.: *See—*
Freed, Meier E.; and Potoski, John R., 4,182,869, Cl. 544-388.000.
Freed, Meier E.; and Potoski, John R., 4,182,872, Cl. 544-389.000.
Pouget, Rene, to Aciers et Outillage Peugeot. Buckle for a safety belt. 4,182,008, Cl. 24-230.00A.
Pouzet, Alain: *See—*
Baudard, Thierry; Schumperli, Max; and Pouzet, Alain, 4,183,022, Cl. 343-6.80R.
Powers, Gaylord D.; and Quist, Donald G., to United States of America, Navy. Self-contained, portable underwater stud welder. 4,182,949, Cl. 219-98.000.
Powers, Harold C.: *See—*
Stratton, Michael K.; Engquist, Karl R.; Keske, Frank E.; Powers, Harold C.; and Sparks, James D., 4,182,122, Cl. 60-322.000.
Powers, Joseph E.; and Grimoldi, Ranoldo H., to Kaiser Steel Corporation. Hydrostatic pipe tester. 4,182,160, Cl. 73-49.500.
PPG Industries, Inc.: *See—*
Henery, Vern A., 4,182,783, Cl. 427-248.00B.
Pradt, Louis A.; and Copa, William M., to Sterling Drug Inc. Oxygen pulping process. 4,182,648, Cl. 162-38.000.
Prebensen, Soren P., to Atlas Copco Aktiebolag. Drill steel centralizer. 4,182,424, Cl. 175-211.000.
Precision Metal Fabricators, Inc.: *See—*
Lenhart, Ronald A., 4,182,586, Cl. 406-87.000.
Prehn, Lawrence D. Circuit for simulating the scrambling of an electromechanical rotor. 4,182,929, Cl. 178-22.000.
Preiss, Michael, to Bayer Aktiengesellschaft. Dioxopiperazine derivatives suitable for use as medicaments and β-lactam antibiotic intermediates. 4,182,762, Cl. 424-250.000.
Presley, C. Travis; and Harrison, Rebecca J., to Marathon Oil Company. Treatment of oil-in-water emulsions. 4,182,689, Cl. 252-330.000.
Presley, Rex W., to Bendix Corporation, The. Rack and pinion power steering. 4,182,221, Cl. 91-378.000.
Presser, Dwight W. Water ski tow handle. 4,182,258, Cl. 115-6.100.
Preston, Anthony: *See—*
Clark, Donald G.; and Preston, Anthony, 4,182,575, Cl. 356-430.000.
Preti, Giulio. Articulator with bite plate guides. 4,182,039, Cl. 433-54.000.
Price, William M., to Anglo-American Clays Corporation. Process for improving rheology of clay slurries. 4,182,785, Cl. 427-361.000.
Procter & Gamble Company, The: *See—*
Des Marais, Thomas A.; and Hughes, Michael K., 4,182,728, Cl. 260-544.00Y.

Proctor, Ronald K., to Elliott Brothers (London) Limited. Hinge joints. 4,182,174, Cl. 73-212.000.
Protectoseal Company, The: *See—*
Zehr, William J., 4,182,384, Cl. 141-7.000.
Prough, James R., to Kamyr, Incorporated. Sound emission level detection. 4,182,177, Cl. 73-290.00V.
Przybylski, Michael: *See—*
Ringsdorf, Helmut; and Przybylski, Michael, 4,182,800, Cl. 525-375.000.
Puechl, Karl H. Nuclear fuel element, core for nuclear reactor, nuclear fuel material. 4,182,652, Cl. 176-50.000.
Pullmax AB: *See—*
Kristiansson, Erik, 4,182,022, Cl. 29-568.000.
Purse, Frank V.: *See—*
Carson, Don B.; and Purse, Frank V., 4,182,741, Cl. 422-211.000.
Putz, John M., to General Electric Company. Filament shields for par lamps. 4,182,970, Cl. 313-113.000.
QC Glide Co.: *See—*
Jones, Barry M., 4,182,081, Cl. 49-434.000.
Quadricolor Technology L.P.: *See—*
Richman, Donald, 4,183,051, Cl. 358-36.000.
Quaglia, Andrea, to Minnesota Mining and Manufacturing Company. Pivalyl-acetanilide couplers and photographic elements including them. 4,182,630, Cl. 430-558.000.
Quigley, Joseph R.: *See—*
Benton, William J.; and Quigley, Joseph R., 4,182,700, Cl. 260-37.00N.
Quillfeldt, Winfried, to Jenoptik Jena G.m.b.H. Arrangement for carrying out laser spectral analysis. 4,182,574, Cl. 356-318.000.
Quist, Donald G.: *See—*
Powers, Gaylord D.; and Quist, Donald G., 4,182,949, Cl. 219-98.000.
R. Alkan & Cie: *See—*
Hasquenoph, Jean H.; and Coutin, Pierre F., 4,182,502, Cl. 244-137.00R.
Rainer, Norman B.; and Feins, Irvin R., to Philip Morris Incorporated. Filter material for selective removal of aldehydes for cigarette smoke. 4,182,743, Cl. 422-211.000.
Ramella, Pier G.: *See—*
Piccardi, Paolo; Confalonieri, Giovanni; Ramella, Pier G.; and Da Col, Lino, 4,182,893, Cl. 424-273.00B.
Ramsay, Anne B.; Luebke, Delbert R.; Guzek, David T.; Hsieh, Chia-Lung; Roteman, Robert; and Leathem, William D., to Abbott Laboratories. High calorie solutions of low molecular weight glucose polymer mixtures useful for intravenous administration. 4,182,756, Cl. 424-180.000.
Ramsey Corporation: *See—*
McCormick, Harold E.; and Berkbigler, Roger L., 4,182,579, Cl. 403-326.000.
Ramsey, James E.: *See—*
MacFadden, John A.; and Ramsey, James E., 4,182,984, Cl. 324-152.000.
Ramuz, Henri: *See—*
Muller, Jean-Claude; and Ramuz, Henri, 4,182,867, Cl. 544-324.000.
Rasmussen, Chris R., to McNeil Laboratories, Inc. Diaza-cyclic derivatives of guanidine. 4,182,865, Cl. 544-60.000.
Ratti, Renald A.: *See—*
Keys, Charles T.; and Ratti, Renald A., 4,182,934, Cl. 179-7.00R.
Ray, John G.: *See—*
Cassidy, Robert E.; Latassa, Frank M.; Roy, J. Arthur; and Ray, John G., 4,182,971, Cl. 313-177.000.
RCA Corporation: *See—*
Aschwanden, Felix, 4,182,994, Cl. 331-1.00A.
Barnette, William E.; and Spong, Fred W., 4,183,060, Cl. 358-128.000.
Breithaupt, David W., 4,183,044, Cl. 358-17.000.
Catanese, Carmen A.; and Endriz, John G., 4,182,969, Cl. 313-105.00R.
Dingwall, Andrew G. F., 4,182,961, Cl. 307-225.00C.
Goel, Jitendra, 4,183,041, Cl. 357-81.000.
Haslau, Horst E., 4,183,002, Cl. 336-192.000.
Hawrylo, Frank Z., 4,182,995, Cl. 331-94.50H.
Herrmann, Donald C.; and Bazin, Lucas J., 4,183,045, Cl. 358-22.000.
Keneman, Scott A.; and Endriz, John G., 4,182,968, Cl. 313-105.00R.
Palmer, Richard C., 4,183,059, Cl. 358-128.000.
Schade, Otto H., Jr., 4,183,020, Cl. 340-629.000.
Weisbrod, Sherman, 4,183,062, Cl. 358-230.000.
Rea, Gary D.: *See—*
Curfman, Don C.; and Rea, Gary D., 4,182,820, Cl. 526-212.000.
Redl, Simon; and Mooser, Johann, to Anton Steinecker Maschinenfabrik GmbH. Apparatus for the production of mash. 4,182,228, Cl. 99-276.000.
Reece, Vernon E. Hand breader. 4,182,260, Cl. 118-26.000.
Reed, Winston H. Non-destructing eggshell egg contents remover. 4,182,234, Cl. 99-495.000.
Reeme, Harvey D.: *See—*
Bruno, Edward C.; and Reeme, Harvey D., 4,182,208, Cl. 83-118.000.
Rees, Huw D., to National Research Development Corporation. Field effect transistors. 4,183,033, Cl. 357-22.000.
Reichel, Pavel: *See—*
Novak, Petr; Pellant, Jaroslav; Zuna, Jaroslav; Kratina, Jindrich; Reichel, Pavel; and Kafunek, Pavel, 4,183,042, Cl. 357-82.000.
Reid, Bruce D. Below waterline deployable hull stabilizing members. 4,182,255, Cl. 114-126.000.
Reid, Francis R., deceased (by Reid, Joan C., administrator), to Pillsbury Company, The. Apparatus for producing fiber cans. 4,182,225, Cl. 93-80.000.
Reid, Joan C., administrator: *See—*
Reid, Francis R., deceased, 4,182,225, Cl. 93-80.000.
Reif, Werner: *See—*
Schulz, Bernhard; Grafen, Paul; Scholz, Hans-Ulrich; Grassner, Hans; and Reif, Werner, 4,182,731, Cl. 260-606.50F.
Reischl, Artur; and Wenzel, Wolfgang, to Bayer Aktiengesellschaft. Production of solutions or dispersions of polyisocyanate polyaddition products containing urethane and/or urea groups and containing both anionic and cationic groups. 4,182,828, Cl. 528-69.000.
Renault, Philippe: *See—*
Bocard, Christian; Renault, Philippe; Seris, Henri; and Gatellier, Claude, 4,182,677, Cl. 210-36.000.
Renfrew, Andrew H. M.; and Bostock, Stephen B., to Imperial Chemical Industries Limited. Process for the preparation of homogentisic lactone. 4,182,720, Cl. 260-343.30R.
Renner, Jerome A., to Kuhlman, Harvey G. Roof shingle remover tool. 4,182,390, Cl. 145-1.00A.
Renovanz, Hans-Dietrich: *See—*
Funk, Gerhard; Weller, Eberhard; Renovanz, Hans-Dietrich; and Papendick, Uwe, 4,182,183, Cl. 73-362.0AR.
Rentmeester, Paul C.: *See—*
Stanke, Dennis A.; and Rentmeester, Paul C., 4,182,484, Cl. 236-1.00C.
Renzacci S.p.A.: *See—*
Righi, Dante, 4,182,050, Cl. 34-60.000.
Research Corporation: *See—*
Wong, John L., 4,182,884, Cl. 546-72.000.
Research Laboratories of Australia Pty. Limited: *See—*
Alston, Julia M., 4,182,266, Cl. 118-621.000.
Resofszki, Gabor: *See—*
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resofszki, Gabor; and Gneth nee Zalantai, Livia, 4,182,892, Cl. 549-79.000.
Reuyl, John S. Integrated residential and automotive energy system. 4,182,960, Cl. 290-1.00R.
Reynolds, James E., to Hazen Research, Inc. Solar energy collector. 4,182,308, Cl. 126-437.000.
Rezabek, Karel: *See—*
Beran, Milos; Krepelka, Jiri; Semonsky, Miroslav; Rezabek, Karel; Seda, Miroslav; and Auskova, Marie, 4,182,883, Cl. 546-67.000.
Rheodyne Incorporated: *See—*
Bakalyar, Stephen R.; and Sylvester, Reginald E., 4,182,184, Cl. 73-422.0GC.
Rhody, Harvey E.; Metildi, Frederic H.; and Granger, Edward M., to Eastman Kodak Company. Video recording apparatus which samples and quantizes low frequencies and then groups and records an analog representation thereof. 4,183,065, Cl. 360-9.000.
Rhone-Poulenc Industries: *See—*
Meyer, Jacques; and Bernelin, Daniel, 4,182,840, Cl. 525-437.000.
Rhone-Poulenc S.A.: *See—*
Janin, Raymond, 4,182,873, Cl. 544-133.000.
Richards, David J.: *See—*
Dodge, Gordon L.; Comstock, Lewis D.; Richards, David J.; and Brackett, Donald L., 4,182,271, Cl. 119-28.000.
Richards, Louis R.: *See—*
Lamartino, Salvatore P.; Richards, Louis R.; and Sandberg, Glenn A., 4,182,003, Cl. 17-32.000.
Richman, Donald, to Quadricolor Technology L.P. Color television receiving system utilizing multimode inferred highs correction to reduce color infidelities. 4,183,051, Cl. 358-36.000.
Rickard, Earl K., to Combustion Engineering, Inc. Slide gate damper. 4,182,359, Cl. 137-246.220.
Ricoh Company, Ltd.: *See—*
Isayama, Takuro; and Fukazawa, Takao, 4,183,029, Cl. 346-140.00R.
Ohbori, Tamio; Matsumoto, Fuyuhiko; and Tomita, Satoru, 4,183,032, Cl. 346-155.000.
Rideout, Vincent L., to International Business Machines Corporation. MOS RAM with implant forming peripheral depletion MOSFET channels and capacitor bottom electrodes. 4,183,040, Cl. 357-41.000.
Rideout, Vincent L.: *See—*
Dennard, Robert H.; and Rideout, Vincent L., 4,182,636, Cl. 148-187.000.
Riedel, Tilo, to S.A. Etablissements Francois Salomon & Fils. Ski brake. 4,182,523, Cl. 280-605.000.
Rieker, Charles M.: *See—*
Ludlow, Roger D.; and Rieker, Charles M., 4,182,046, Cl. 33-366.000.
Ries, Karl: *See—*
Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simoneit, Gunter; and Ries, Karl, 4,182,154, Cl. 73-1.0DV.
Righi, Dante, to Renzacci S.p.A. Laundry apparatus and dryers. 4,182,050, Cl. 34-60.000.
Rikagaku Kenkyusho: *See—*
Goto, Eiichi; Idesawa, Masanori; Sasaki, Tateaki; and Soma, Takashi, 4,182,958, Cl. 250-492.00A.
Ringsdorf, Helmut; and Przybylski, Michael, to Hercules Incorporated. Methotrexate-divinyl ether—maleic anhydride copolymer reaction product. 4,182,800, Cl. 525-375.000.
Ritchie, Andrew W. Folding bicycles. 4,182,522, Cl. 280-278.000.
Rius, Roberto R. Sanitary spray attachment for toilet bowl. 4,181,985, Cl. 4-7.000.

Robert Bosch GmbH: *See*—
Dworak, Wilhelm; Muller, Karl-Heinz; and Talmon, Wolfgang, 4,182,602, Cl. 418-132.000.
Greiner, Max; and Nusser, Hermann, 4,182,298, Cl. 123-139.0AW.
Harig, Horst, 4,182,235, Cl. 100-3.000.
Zeller, Hans; Latsch, Reinhard; Brettschneider, Johannes; and Bianchi, Valerio, 4,182,295, Cl. 123-119.0EC.

Roberts, David J.; and Simmons, John, to International Business Machines Corporation. Protection of data processing system against unauthorized programs. 4,183,085, Cl. 364-200.000.

Roberts, Gordon J.; and Heasley, James H., to Ferro Corporation. Unstable devitrifiable glasses and friction materials containing them. 4,182,437, Cl. 188-251.00A.

Robertshaw Controls Company: *See*—
Strachan, Robert; and Goodhouse, Carl J., 4,182,112, Cl. 58-39.500.

Robinson, Dale: *See*—
Morgan, Charles W.; Robinson, Dale; and Farag, Farouk, 4,181,991, Cl. 5-400.000.

Robinson, Glen P., Jr. Heat transfer system. 4,182,409, Cl. 165-104.00S.

Robugen GmbH Pharmaceutische Fabrik: *See*—
Erhardt, Siegfried, 4,182,859, Cl. 536-23.000.

Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; and Haarmann, Walter, to Boehringer Ingelheim GmbH. 3-Amino-4-phenyl-1H-pyrazolo[3,4-b]pyridines and salts thereof. 4,182,887, Cl. 546-119.000.

Rockwell International Corporation: *See*—
Wang, Cheng-Chi; Pasko, John G.; Longo, Joseph T.; and Clarke, John E., 4,183,035, Cl. 357-30.000.

Rodish, John. Flame-retardant additive for foamed polystyrene. 4,182,799, Cl. 521-98.000.

Rodriguez, Rene. Animal suppository holder. 4,182,331, Cl. 128-271.000.

Roennau, Raymond B.: *See*—
Larson, William M.; Patitsas, George P.; and Roennau, Raymond B., 4,182,393, Cl. 152-353.00R.

Roesler, Helmut: *See*—
Bigall, Klaus D.; Muehlbauer, Otto; and Roesler, Helmut, 4,182,211, Cl. 84-1.010.

Rohm and Haas Company: *See*—
Chan, Hak-Foon, 4,182,862, Cl. 542-440.000.

Rolf, ckhard, to Erno Raumfahrttechnik GmbH. Rescue equipment for submarine crafts. 4,182,257, Cl. 114-333.000.

Romano, Ugo: *See*—
Illuminati, Gabriello; Romano, Ugo; and Tesei, Renato, 4,182,726, Cl. 260-463.000.

Rosenberg, Adam N. Articulated parallelogram phonograph tonearm. 4,182,517, Cl. 274-23.00R.

Rosenblum, Howard E., to United States of America, Army. Secure communication system with remote key setting. 4,182,933, Cl. 179-1.50R.

Rosenkranz, Hans J.: *See*—
Walkowiak, Michael; Schulz, Hans-Hermann; and Rosenkranz, Hans J., 4,182,829, Cl. 528-75.000.

Roteman, Robert: *See*—
Ramsay, Anne B.; Luebke, Delbert R.; Guzek, David T.; Hsieh, Chia-Lung; Roteman, Robert; and Leathem, William D., 4,182,756, Cl. 424-180.000.

Roullet, Gerald; Bortuzzo, Jean-Pierre; and Chevalier, Serge, to Thomson-Brandt. Support apparatus for a flexible disc and disc reader using this support apparatus. 4,183,069, Cl. 360-102.000.

Rowatt, Robert J.: *See*—
Lynch, Thomas J.; and Rowatt, Robert J., 4,182,817, Cl. 526-169.000.

Roy, J. Arthur: *See*—
Cassidy, Robert E.; Latassa, Frank M.; Roy, J. Arthur; and Ray, John G., 4,182,971, Cl. 313-177.000.

Roy, Michel. Ventilation diffuser. 4,182,227, Cl. 98-40.00D.

Royer, Garfield P., to Pierce Chemical Company. Production of polypeptides using polynucleotides. 4,182,654, Cl. 195-4.000.

Rumianca S.p.A.: *See*—
Baldi, Luciano; Giorcelli, Giuliano; and Francese, Renato, 4,182,874, Cl. 544-204.000.
Francese, Renato; and Esposito, Roberto, 4,182,875, Cl. 544-204.000.

Runge, Erich, to Albert Berner. Straddling dowel construction. 4,182,217, Cl. 85-71.000.

Russell, Ronald R., to General Electric Company. Control circuit for resetting circuit breaker UVR solenoid. 4,183,071, Cl. 361-59.000.

Russo, Ronald D. Air inhalation flow rate measuring device. 4,182,347, Cl. 128-725.000.

Rustenburg Platinum Mines Limited: *See*—
Tobe, Martin L.; Khokhar, Abdul R.; and Braddock, Peter D. M., 4,182,724, Cl. 260-429.00R.

Rutman, Grigory I.: *See*—
Borgardt, Valentina J.; Volodin, Jury I.; Shalimova, Zoya S.; Pantukh, Boris T.; Egoricheva, Sofya A.; Rutman, Grigory I.; and Michurov, Jury I., 4,182,921, Cl. 568-750.000.

S&C Electric Company: *See*—
Meister, Otto; and Tobin, Thomas J., 4,183,005, Cl. 337-275.000.

Sabo, Michael. Heat retaining device. 4,182,310, Cl. 126-400.000.

Sachse, Burkhard: *See*—
Soder, Alfons; Bieringer, Hermann; Burstell, Helmut; Langeluddeke, Peter; and Sachse, Burkhard, 4,182,624, Cl. 71-92.000.

Saegusa, Takeo; Yamada, Akira; Iwase, Masaaki; and Iwatani, Akitoshi, to Daikin Kogyo Co., Ltd. Fluorine-containing copolymers, and their production and use. 4,182,846, Cl. 528-341.000.

Sahara, Hiroshi; and Tanaka, Yutaka, to Sony Corporation. Video signal reproducing apparatus with electron beam scanning velocity modulation. 4,183,064, Cl. 358-242.000.

Saito, Hisatoshi: *See*—
Furuta, Naofumi; and Saito, Hisatoshi, 4,182,571, Cl. 356-53.000.

Sakaguchi, Mitsuo, to Kobishi Electric Co., Ltd. Motor driven type gong striking mechanism. 4,183,018, Cl. 340-396.000.

Sakaguchi, Toshiaki: *See*—
Takagi, Toshio; Uemura, Katsuhiko; and Sakaguchi, Toshiaki, 4,183,072, Cl. 361-68.000.

Sakano, Kozaburo: *See*—
Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,182,457, Cl. 215-1.00C.

Sakurai, Yojiro: *See*—
Fujii, Setsuro; Kawamura, Hiroyuki; Taira, Seizo; Matsui, Ryoji; Sakurai, Yojiro; and Okutome, Toshiyuki, 4,182,897, Cl. 560-19.000.

Sakurazawa, Hatuo, to Acecoor Co., Ltd.; and Sakurazawa, Hatuo. Apparatus for frying noodles. 4,182,230, Cl. 99-349.000.

Salimov, Vyacheslav K.: *See*—
Sinelnikov, Alexandr V.; Patushinskaya, Raisa S.; Freidgeim, Lazar I.; Bizev, Anatoly A.; Druzhkova, Larisa M.; Salimov, Vyacheslav K.; Lebedich, Sergei P.; Lvov, Sergei L.; Minkina, Margarita E.; Shurygin, Alexandr P.; Levin, Valery S.; Faradzh-Zade, Solmaz A.; Lebedev, Igor V., deceased; and Lebedeva, Marina I., administrator, 4,182,358, Cl. 137-115.000.

Saltarelli, Cora G. Sarcoma 180 tumor inhibitor and method of making same. 4,182,753, Cl. 424-115.000.

Salyer, Ival O.; Botham, Ruth A.; and Ball, George L., III, to United States of America, Energy. Crosslinked crystalline polymer and methods for cooling and heating. 4,182,398, Cl. 165-1.000.

Sanada, Seiji: *See*—
Isono, Katsuo; and Sanada, Seiji, 4,183,048, Cl. 358-28.000.

Sandberg, Glenn A.: *See*—
Lamartino, Salvatore P.; Richards, Louis R.; and Sandberg, Glenn A., 4,182,003, Cl. 17-32.000.

Sanders, Larry D.; and Gilbert, Marvin E. Water screen. 4,182,414, Cl. 166-74.000.

Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,182,140, Cl. 68-5.00E.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,182,141, Cl. 68-5.00E.
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Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Cloth cleaning method with steaming and liquid flow and an apparatus therefor. 4,182,140, Cl. 68-5.00E.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Apparatus for carrying out continuous cloth material treating process. 4,182,141, Cl. 68-5.00E.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Continuous cloth dyeing-and-washing apparatus. 4,182,142, Cl. 68-5.00E.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. High pressure steamer incorporating monomer recovering mechanism. 4,182,143, Cl. 68-5.00E.

Sandoz Ltd.: *See*—
Fleck, Fritz; Balzer, Hans; and Aebli, Horst, 4,182,861, Cl. 542-441.000.

Sanford, William C.: *See*—
Argabrite, George A.; and Sanford, William C. (George A. Angabrite and William C. Sanford assors. to), 4,182,192, Cl. 73-818.000.

Sano, Minoru, to Fujisoku Electric Co., Ltd. Toggle switch with a light emitting diode element attached to the top end of a knob. 4,182,944, Cl. 200-315.000.

Santo, Philip J. Perimeter support for a waterbed mattress. 4,181,990, Cl. 5-452.000.

Sanyo Electric Co., Ltd.: *See*—
Hosoya, Nobukazu, 4,183,049, Cl. 358-28.000.

SAPAL, Societe Anonyme des Plieuses Automatiques: *See*—
Pongracz, Endre, 4,182,443, Cl. 198-460.000.

Saperstein, David D., to Merck & Co., Inc. Catalytic process for obtaining methane from methanol. 4,182,926, Cl. 585-733.000.

Sarantakis, Dimitrios, to American Home Products Corporation. Somatostatin analogues. 4,182,707, Cl. 260-112.50S.

Sasaki, Tateaki: *See*—
Goto, Eiichi; Idesawa, Masanori; Sasaki, Tateaki; and Soma, Takashi, 4,182,958, Cl. 250-492.00A.

Sato, Hisao. Stapler having staple and tag magazines. 4,182,474, Cl. 227-99.000.

Sato, Katsujiro; Nakanishi, Kiyoshi; and Okumura, Takeshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Combustion chamber of an internal combustion engine. 4,182,279, Cl. 123-30.00C.

Sato, Yoshiyasu: *See*—
Yamada, Masaru; Mori, Atsushi; Sato, Yoshiyasu; Terayama, Kenichi; and Miyatani, Shogo, 4,182,634, Cl. 127-55.000.

Saucy, Gabriel: *See*—
Cohen, Noal; and Saucy, Gabriel, 4,182,719, Cl. 260-340.90R.

Saunders, Elmer J.; and Lappin, Terry A., to Standard Oil Company (Indiana). Co-dried yeast whey food product and process. 4,182,777, Cl. 426-62.000.

Saunier Duval: *See*—
Storez, Franz J. F., 4,183,000, Cl. 335-263.000.
Savage, Trevor C.: *See*—
Brooks, David S.; and Savage, Trevor C., 4,183,001, Cl. 336-62.000.
Savit, Carl H., to Western Geophysical Company of America. Hydraulically-coupled, land seismic signal source. 4,182,428, Cl. 181-114.000.
Sawagata, Kiyoshi, to Sony Corp. Parallel analog-to-digital converter with increased resolution. 4,183,016, Cl. 340-347.0AD.
Sawyer, Bobby G.: *See*—
Davis, Wilbur M.; Sawyer, Bobby G.; and Nichols, John A., 4,182,099, Cl. 56-16.400.
Saxman, William C.: *See*—
Youngblood, Thomas F.; Saxman, William C.; and Wilemon, Gerald F., 4,182,422, Cl. 175-53.000.
Scapa-Porritt Limited: *See*—
Gisbourne, Bryan J., 4,182,381, Cl. 139-383.00A.
Schaar, Charles H., to Colgate-Palmolive Company. Disposable diaper with fastener retained end barrier. 4,182,333, Cl. 128-287.000.
Schade, Otto H., Jr., to RCA Corporation. Amplifier with field effect and bipolar transistors. 4,183,020, Cl. 340-629.000.
Schafer, David E.: *See*—
Houbion, John A.; and Schafer, David E., 4,182,622, Cl. 71-88.000.
Schall, Frederick R.; and Kessler, Frank L., to Ester Williams Swimming Pools. Swimming pool. 4,182,087, Cl. 52-169.700.
Scheiber, Werner, to Metallgesellschaft Aktiengesellschaft. Method of a coating on the outside surface of a metal pipe. 4,182,782, Cl. 427-195.000.
Scheidt, Gerald A.: *See*—
Carter, Joe M.; Lever, Clyde J., Jr.; and Scheidt, Gerald A., 4,182,107, Cl. 57-293.000.
Schenck, Hans-Uwe: *See*—
Straub, Ferdinand; Spoor, Herbert; Schenck, Hans-Uwe; and Schwarz, Wolfgang, 4,182,851, Cl. 528-491.000.
Schick, John W.; and Gemmill, Robert M., Jr., to Mobil Oil Corporation. Synthetic hydrocarbon lubricating oil. 4,182,922, Cl. 585-18.000.
Schlicker, Melvin C., to Corning Glass Works. Optical waveguide shipping spool. 4,182,500, Cl. 242-118.700.
Schmid, Walter: *See*—
Huber, Guntram; and Schmid, Walter, 4,182,190, Cl. 73-794.000.
Schmidle, Claude J., to Thiokol Corporation. Liquid alkylacrylamides and related compositions. 4,182,790, Cl. 428-260.000.
Schmidle, Claude J.; and Barclay, Robert, Jr., to Thiokol Corporation. Photocurable compositions. 4,182,848, Cl. 528-376.000.
Schmidt, Eric W.; Miga, Lawrence W.; and Gieseke, James A., to United States of America, Agriculture. Dust precutter and method. 4,182,673, Cl. 209-45.000.
Schmidt, Gunter: *See*—
Koerner, Gotz; Schmidt, Gunter; and Nickel, Friedhelm, 4,182,682, Cl. 252-8.600.
Schmidt, Hans-Georg; Daum, Gerhard; and Vogt, Wilhelm, to Dynamit Nobel Aktiengesellschaft. Method of preparing orthoacetic acid alkyl esters. 4,182,910, Cl. 568-595.000.
Schmidt, Manfred; Freitag, Dieter; Fries, Hermann; and Esch, Erich, to Bayer Aktiengesellschaft. Process for the preparation of boron-containing phenol-formaldehyde resins. 4,182,697, Cl. 260-19.00R.
Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. Carbazole containing phthalides. 4,182,714, Cl. 260-315.000.
Schmidt, Thomas: *See*—
Mues, Volker; Behrenz, Wolfgang; Ditgens, Klaus; and Schmidt, Thomas, 4,182,771, Cl. 424-282.000.
Schmidt, Wilhelm: *See*—
Meyering, Otto; and Schmidt, Wilhelm, 4,182,791, Cl. 428-248.000.
Schmucker, William A.; and Dings, Lloyd M., Jr., to Allis-Chalmers Corporation. Continuous casting mold and means for securing mold liners therein. 4,182,397, Cl. 164-443.000.
Schneider, Mark R.: *See*—
Molloy, Len; and Schneider, Mark R., 4,182,020, Cl. 29-469.500.
Schoenberg, Jules E., to National Starch and Chemical Corporation. Anionic polymerization inhibitor for cyanoacrylate adhesives. 4,182,823, Cl. 526-298.000.
Scholkens, Bernward: *See*—
Bartmann, Wilhelm; Lerch, Ulrich; Teufel, Hermann; Scholkens, Bernward; and Beck, Gerhard, 4,182,773, Cl. 424-305.000.
Scholz, Hans-Ulrich: *See*—
Schulz, Bernhard; Grafen, Paul; Scholz, Hans-Ulrich; Grassner, Hans; and Reif, Werner, 4,182,731, Cl. 260-606.50F.
Scholz, Werner: *See*—
Dickopp, Gerald; Mahler, Gerhard; and Scholz, Werner, 4,183,043, Cl. 358-11.000.
Schomer, Marion L.: *See*—
Hewson, John E.; and Schomer, Marion L., 4,182,362, Cl. 137-340.000.
Schrewelius, Nils G.: *See*—
Dock, Carl G.; and Schrewelius, Nils G., 4,182,189, Cl. 73-761.000.
Schroder, Erwin: *See*—
Muller, Wolfgang W.; Dobberstein, Hans H.; and Schroder, Erwin, 4,182,482, Cl. 235-454.000.
Schultz, Edward H., Jr. Pulley. 4,182,193, Cl. 74-230.800.
Schultz, Sidney J.: *See*—
Wynstra, John; and Schultz, Sidney J., 4,182,696, Cl. 260-17.200.
Schulz, Bernhard; Grafen, Paul; Scholz, Hans-Ulrich; Grassner, Hans; and Reif, Werner, to BASF Aktiengesellschaft. Preparation of aqueous solutions or fine aqueous dispersions of polyenyltriarylphosphonium salts. 4,182,731, Cl. 260-606.50F.
Schulz, Hans-Hermann: *See*—
Walkowiak, Michael; Schulz, Hans-Hermann; and Rosenkranz, Hans J., 4,182,829, Cl. 528-75.000.
Schumag Schumacher Metallwerke: *See*—
Greven, Johann, 4,182,150, Cl. 72-290.000.
Schumperli, Max: *See*—
Baudard, Thierry; Schumperli, Max; and Pouzet, Alain, 4,183,022, Cl. 343-6.80R.
Schwab, Gunther: *See*—
Mueller, Erwin; and Schwab, Gunther, 4,182,998, Cl. 335-151.000.
Schwartz, Nelson N., to Technical Processing, Inc. Novel processing aids for natural and synthetic rubber compounds. 4,182,702, Cl. 260-42.160.
Schwarz, Wolfgang: *See*—
Straub, Ferdinand; Spoor, Herbert; Schenck, Hans-Uwe; and Schwarz, Wolfgang, 4,182,851, Cl. 528-491.000.
Schweitzer, Karl: *See*—
Zimmer, Peter; Kudlich, Hans; and Schweitzer, Karl, 4,182,660, Cl. 204-11.000.
Schwerdtel, Wulf: *See*—
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,182,917, Cl. 568-771.000.
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,182,918, Cl. 568-771.000.
Sciavolino, Frank C., to Pfizer Inc. Semi-synthetic oleandomycin derivatives - C_8 modifications. 4,182,857, Cl. 536-9.000.
Sciavolino, Frank C., to Pfizer Inc. Semi-synthetic oleandomycin derivatives - C_8 modifications. 4,182,858, Cl. 536-9.000.
Scott, Arnett P. Surgical splint. 4,182,319, Cl. 128-79.000.
Scott, John G. V.: *See*—
Kitzing, Rainer; Scott, John G. V.; Webb, Terence C.; and Evans, Graham, 4,182,886, Cl. 546-304.000.
Scott, John H.; and Harang, Arlyn O., to Boeing Company, The. Automatic takeoff controller for hydrofoil craft. 4,182,256, Cl. 114-282.000.
Screw Machine Products, Inc.: *See*—
Goertz, Ronald A., 4,182,436, Cl. 188-77.00R.
Scribner, Frank F.: *See*—
Hurliman, Russell J.; and Scribner, Frank F., 4,182,420, Cl. 171-38.000.
Scussel, August J.; Fedison, Walter W., Jr.; and Michie, Donald R., to Ford Motor Company. High voltage distributor for dual ignition system. 4,182,940, Cl. 200-19.00R.
SEA Investigation Division, Inc.: *See*—
MacCleary, Randall C.; and Thaman, Ronald N., 4,182,959, Cl. 250-492.00R.
Searight, Charles E.; and Heasley, James E., to Ferro Corporation. Retroreflective marking tape. 4,182,548, Cl. 350-103.000.
Searle, Robert F., to Vibrac Corporation. Electric motor manufacture. 4,182,026, Cl. 29-596.000.
Sears, Stephan B.: *See*—
Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., 4,183,031, Cl. 346-140.00R.
Secord, Campbell. Tanks for the storage and transport of fluid media under pressure. 4,182,254, Cl. 114-74.00A.
Seda, Miroslav: *See*—
Beran, Milos; Krepelka, Jiri; Semonsky, Miroslav; Rezabek, Karel; Seda, Miroslav; and Auskova, Marie, 4,182,883, Cl. 546-67.000.
Seehofer, Friedlieb; and Kausch, Erwin, to B.A.T. Cigaretten-Fabriken GmbH. Removal of nitric oxide and carbon monoxide from tobacco smoke. 4,182,348, Cl. 131-10.00R.
Segovia, Iraida V. Stocking with convertible toe opening. 4,181,982, Cl. 2-239.000.
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft. Process for the preparation of polyhydric phenols. 4,182,917, Cl. 568-771.000.
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft. Process for the preparation of polyhydric phenols. 4,182,918, Cl. 568-771.000.
Sekimura, Nobuyuki: *See*—
Yoshihara, Satoshi; and Sekimura, Nobuyuki, 4,182,647, Cl. 430-314.000.
Selke, William A., to Kimberly-Clark Corporation. Method of making reconstituted tobacco. 4,182,349, Cl. 131-140.00C.
Sellen, Kenneth R., to Burroughs Corporation. Fluid coupling system. 4,182,388, Cl. 141-351.000.
Semi-Bulk Systems, Inc.: *See*—
Alack, Charles S., 4,182,386, Cl. 141-83.000.
Semonsky, Miroslav: *See*—
Beran, Milos; Krepelka, Jiri; Semonsky, Miroslav; Rezabek, Karel; Seda, Miroslav; and Auskova, Marie, 4,182,883, Cl. 546-67.000.
Senzaki, Hiroshi, to Kabushiki Kaisha Senzaki Seisakusho. Loudspeaker system. 4,182,429, Cl. 181-144.000.
Seppi, Edward J.; Harell, George S.; and Morehouse, Charles C., to Varian Associates, Inc. Method and system for cardiac computed tomography. 4,182,311, Cl. 128-653.000.
Serboli, Giancarlo; Straziota, Maurizio; and La Barba, Nicolina, to Anic S.p.A. Preparation of polymers which contain amine groups or salts thereof and/or quaternary ammonium groups and polymers obtained. 4,182,804, Cl. 525-56.000.
Seris, Henri: *See*—
Bocard, Christian; Renault, Philippe; Seris, Henri; and Gatellier, Claude, 4,182,677, Cl. 210-36.000.
Sevenich, Theodor: *See*—
Wladika, Hans; and Sevenich, Theodor, 4,182,146, Cl. 72-202.000.

Shalimova, Zoya S.: *See—*
Borgardt, Valentina J.; Volodin, Jury I.; Shalimova, Zoya S.; Pantukh, Boris T.; Egoricheva, Sofya A.; Rutman, Grigory I.; and Michurov, Jury I., 4,182,921, Cl. 568-750.000.

Shanfelt, Donald: *See—*
Brindle, Dannie K.; and Shanfelt, Donald Y., 4,182,307, Cl. 126-432.000.

Shanfelt, Donald Y.: *See—*
Brindle, Dannie K.; and Shanfelt, Donald Y., 4,182,307, Cl. 126-432.000.

Sharp Kabushiki Kaisha: *See—*
Masuda, Toshiyuki, 4,182,115, Cl. 58-88.00R.

Sharpe, Thomas R.: *See—*
Cherkofsky, Saul C.; and Sharpe, Thomas R., 4,182,769, Cl. 424-273.00R.

Shekleton, Jack R. Vortex automotive combustion engine. 4,182,280, Cl. 123-30.00C.

Shell Container Systems: *See—*
Lovewell, Jack S., 4,182,476, Cl. 229-17.00B.

Shell Oil Company: *See—*
Badmin, John S.; and Knight, Robert J., 4,182,772, Cl. 424-304.000.

Shen, Chah M.: *See—*
Loshaek, Samuel; and Shen, Chah M., 4,182,802, Cl. 526-264.000.

Shenk, Edwin K.: *See—*
Biber, Conrad H.; Shenk, Edwin K.; and Tam, Shirley Y., 4,182,563, Cl. 354-197.000.

Shepherd, Robert G.: *See—*
Albright, Jay D.; Miner, Thomas G.; and Shepherd, Robert G., 4,182,776, Cl. 424-319.000.

Sheridon, Nicholas K., to Xerox Corporation. Honeycomb display devices. 4,182,553, Cl. 350-336.000.

Shibatani, Kyoichiro: *See—*
Yamauchi, Junichi; Yamada, Kunitake; and Shibatani, Kyoichiro, 4,182,035, Cl. 433-228.000.

Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; and Suzuki, Takatoshi, to Sumitomo Chemical Company, Limited. Process for refining a homopolymer of copolymer of propylene. 4,182,852, Cl. 528-494.000.

Shiley Incorporated: *See—*
Curtis, Robert M., 4,182,739, Cl. 422-47.000.

Shima, Kenji: *See—*
Hibino, Masahiro; and Shima, Kenji, 4,182,209, Cl. 84-1.010.

Shimamoto, Takio; and Ishikawa, Masayuki. Substituted-phthalazone 7-carboxylic acid and salts and process for preparing same. 4,182,876, Cl. 544-237.000.

Shimizu, Masami: *See—*
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Iwashita, Tomonori; and Shimizu, Masami, 4,182,557, Cl. 354-60.00R.

Shimodaira, Tadayoshi: *See—*
Mitsui, Yoshihiro; and Shimodaira, Tadayoshi, 4,182,240, Cl. 101-99.000.

Shimohori, Yukio: *See—*
Takano, Hideo; Shimohori, Yukio; and Fukuda, Shigeho, 4,182,734, Cl. 264-40.500.

Shinshu Seiki Kabushiki Kaisha: *See—*
Fujimori, Kazuyoshi; and Mitsuishi, Akio, 4,182,576, Cl. 400-221.000.
Mitsui, Yoshihiro; and Shimodaira, Tadayoshi, 4,182,240, Cl. 101-99.000.

Shipov, Stanislav V.: *See—*
Zubarev, Anatoly I.; Osipovsky, Lev F.; and Shipov, Stanislav V., 4,182,421, Cl. 173-105.000.

Shirahase, Ichiro: *See—*
Murai, Hiromu; Enomoto, Hiroshi; Aoyagi, Yoshiaki; Yoshikuni, Yoshiaki; Yagi, Masahiro; and Shirahase, Ichiro, 4,182,767, Cl. 424-267.000.

Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See—*
Fukano, Yoshihiro; and Oneyama, Naotake, 4,182,375, Cl. 137-625.690.

Shouse, John F., Jr.: *See—*
Kim, Seung K.; and Shouse, John F., Jr., 4,183,047, Cl. 358-27.000.

Shum, Lanson Y.; and Brecker, James N., to Westinghouse Electric Corp. Apparatus for gauging the shape of a conducting surface. 4,182,981, Cl. 324-61.00R.

Shum, Ming S., to UOP Inc. Finned heat transfer tube with porous boiling surface and method for producing same. 4,182,412, Cl. 165-133.000.

Shurygin, Alexandr P.: *See—*
Sinelnikov, Alexandr V.; Patushinskaya, Raisa S.; Freidgeim, Lazar I.; Bizev, Anatoly A.; Druzhkova, Larisa M.; Salimov, Vyacheslav K.; Lebedich, Sergei P.; Lvov, Sergei L.; Minkina, Margarita E.; Shurygin, Alexandr P.; Levin, Valery S.; Faradzh-Zade, Solmaz A.; Lebedev, Igor V., deceased; and Lebedeva, Marina I., administrator, 4,182,358, Cl. 137-115.000.

Siegfried Aktiengesellschaft: *See—*
Thiele, Kurt; Armed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,182,902, Cl. 562-468.000.

Siegmund, Walter P., to American Optical Corporation. Image focusing apparatus for fiberscopes. 4,182,547, Cl. 350-96.260.

Siemens Aktiengesellschaft: *See—*
Bigall, Klaus D.; Muehlbauer, Otto; and Roesler, Helmut, 4,182,211, Cl. 84-1.010.
Fleer, Ernst O., 4,182,038, Cl. 433-85.000.
Kober, Rudolf, 4,183,086, Cl. 364-200.000.
Mueller, Erwin; and Schwab, Gunther, 4,182,998, Cl. 335-151.000.
Mueller, Ruediger, 4,183,036, Cl. 357-44.000.
Naeser, Helmut; and Mendisch, Norbert, 4,182,263, Cl. 118-60.000.
Nilsson, Kenth; Hoek, Bertil; Ohlsson, Thomas; and Bjelkhagen, Hans, 4,182,316, Cl. 128-665.000.
Pfleiderer, Hans, 4,182,965, Cl. 307-299.00R.

Siempelkamp Giesserei GmbH & Co.: *See—*
Gulicher, Lothar, 4,182,018, Cl. 29-446.000.

Sigas, Costas A. Nutcracker. 4,182,226, Cl. 99-578.000.

Sigeki, Isii, to Nippon Gakki Seizo Kabushiki Kaisha. Method of and apparatus for automatically playing arpeggio in electronic musical instrument. 4,182,212, Cl. 84-1.030.

Sigel, George H., Jr.: *See—*
Maklad, Mokhtar S.; Sigel, George H., Jr.; and Bickel, Gary W., 4,182,664, Cl. 204-157.10H.

Silonics, Inc.: *See—*
Kyser, Edmond L.; Mitchell, Charles S.; and Sears, Stephan B., 4,183,031, Cl. 346-140.00R.

Simmons, John: *See—*
Roberts, David J.; and Simmons, John, 4,183,085, Cl. 364-200.000.

Simmons, Robert E., to United States of America, Navy. Random number generator. 4,183,088, Cl. 364-717.000.

Simoneit, Gunter: *See—*
Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simoneit, Gunter; and Ries, Karl, 4,182,154, Cl. 73-1.0DV.

Sims, Claude C., to Marine Resources, Inc. Alarm buzzer apparatus. 4,183,017, Cl. 340-384.00R.

Simulaids, Inc.: *See—*
Sweeney, Kevin M., 4,182,320, Cl. 128-89.00R.

Sinelnikov, Alexandr V.; Patushinskaya, Raisa S.; Freidgeim, Lazar I.; Bizev, Anatoly A.; Druzhkova, Larisa M.; Salimov, Vyacheslav K.; Lebedich, Sergei P.; Lvov, Sergei L.; Minkina, Margarita E.; Shurygin, Alexandr P.; Levin, Valery S.; Faradzh-Zade, Solmaz A.; Lebedev, Igor V., deceased (by Izbash, Anna S., Marina I. Lebedeva, administrators); and by Lebedeva, Marina I., administrator, to Vsesojuzny Nauchno-Issledovatelsky Institut Komplexnoi Avtomatizatsii Neftyanoi I Gazovoi Promyshlennosti. System for limiting rate of pressure rise in pipeline during hydraulic impact. 4,182,358, Cl. 137-115.000.

Singer Company, The: *See—*
Johnson, Ralph E., 4,182,250, Cl. 112-184.000.

Sitma S.p.A. Societa Italiana Macchine Automatiche: *See—*
Ballestrazzi, Aris; Tassi, Lamberto; and Tosarelli, Gianni, 4,182,096, Cl. 53-553.000.

Skaggs, Bill. Adjustable size toilet seat. 4,181,988, Cl. 4-237.000.

Skarstad, Paul M., to Medtronic, Inc. Preformed polymer sheet in combination with the anode of electrochemical cells. 4,182,798, Cl. 429-213.000.

Smetanjuk, Vladimir I.: *See—*
Bocharov, Jury N.; Kabanov, Viktor A.; Martynova, Marina A.; Popov, Valery G.; Smetanjuk, Vladimir I.; and Fedorov, Viktor V., 4,182,811, Cl. 526-69.000.

Smit, Helen E.; and Smit, Julie A. Acne facial treatment appliance and method. 4,182,329, Cl. 128-256.000.

Smit, Julie A.: *See—*
Smit, Helen E.; and Smit, Julie A., 4,182,329, Cl. 128-256.000.

Smith, Gordon E., to Med-Pro, Ltd. Naso-gastric feeding device and method of inserting same. 4,182,342, Cl. 128-348.000.

Smith, Howard W.: *See—*
Cleveland, Lewis C.; and Smith, Howard W., 4,183,003, Cl. 337-156.000.

Smith International, Inc.: *See—*
Garrett, William R., 4,182,425, Cl. 175-228.000.

Smith, Jay, III; and Hedgcoth, Virgle, to Identicator Corporation. Credit card printer for fingerprints and solutions. 4,182,261, Cl. 118-31.500.

Smith, Terry L., to Dual Light Inc. Lithographic dual light source apparatus. 4,182,569, Cl. 355-84.000.

Smith, William L.; and Lalk, Robert H., to Dow Chemical Company, The. Method for applying a fire-retardant composition to wood. 4,182,794, Cl. 428-537.000.

Smiths Industries Limited: *See—*
Cooper, Ronald H.; Goreham, Kenneth A.; and Wakeford, Christopher B., 4,182,009, Cl. 29-25.120.

Smorol, Michael E.: *See—*
Haas, Rudy E.; Smorol, Michael E.; and Hayes, Richmond S., 4,182,133, Cl. 62-93.000.

Smyth County Dialysis Unit: *See—*
Stanulis, Nancy U., 4,182,338, Cl. 128-325.000.

Snamprogetti, S.p.A.: *See—*
Illuminati, Gabriello; Romano, Ugo; and Tesei, Renato, 4,182,726, Cl. 260-463.000.

Snyder, David M. Directional control valve system. 4,182,534, Cl. 298-22.00C.

Sochats, Kenneth M.: *See—*
Mishra, Anil K.; Hammer, Joel B.; and Sochats, Kenneth M., 4,182,966, Cl. 310-59.000.

Societe Anonyme des Etablissments Staubli: *See—*
Palau, Joseph, 4,182,380, Cl. 139-68.000.

Societe Anonyme des Fonderies et Ateliers L. CHOQUENET: *See—*
Carle, Jean-Claude A., 4,182,680, Cl. 210-386.000.

S.A. Etablissements Francois Salomon & Fils: *See—*
Riedel, Tilo, 4,182,523, Cl. 280-605.000.

s.a. Texaco Belgium n.v.: *See—*
Hermans, Johny C., 4,182,792, Cl. 528-332.000.

Societe de Prospection et d'Inventions Techniques, SPIT: *See—*
Combette, Marc; and Luthringer, Jean, 4,182,218, Cl. 85-84.000.

Societe d'Etudes de Machines Thermiques S.E.M.T.: *See*—
Pollet, Jean-Pierre, 4,182,282, Cl. 123-41.760.
"Societe d'Optique, Precision Electronique et Mecanique" Sopelem: *See*—
Courrier, Gilbert; Duchet, Michel; Leblanc, Michele; and Moirez, Jacques, 4,182,570, Cl. 356-28.000.
Societe Hexachimie: *See*—
Teulon, Jean-Marie, 4,182,896, Cl. 560-8.000.
Societe Italiana Telecomunicazioni Siemens S.p.A.: *See*—
Brambilla, Giuliano, 4,182,997, Cl. 333-175.000.
Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See*—
Gagnebin, Pierre-Luc, 4,182,114, Cl. 58-59.000.
Soder, Alfons; Bieringer, Hermann; Burstell, Helmut; Langeluddeke, Peter; and Sachse, Burkhard, to Hoechst Aktiengesellschaft. Imidazole carboxylic acids and derivatives thereof. 4,182,624, Cl. 71-92.000.
Sogemaric: *See*—
Denninger, Claude; Joly, Michel; and Tabet, Jean-Noel, 4,182,620, Cl. 71-65.000.
Sokol, Phillip E.; and Tsai, Hu-Chu, to Gillette Company, The. Method for dyeing human hair with cationic polymeric dyes. 4,182,612, Cl. 8-10.100.
Solvay & Cie.: *See*—
Vanlautem, Noel; and Mulders, Julien, 4,182,806, Cl. 525-369.000.
Vanlautem, Noel; Mulders, Julien; and Gilain, Jacques, 4,182,807, Cl. 525-387.000.
Soma, Takashi: *See*—
Goto, Eiichi; Idesawa, Masanori; Sasaki, Tateaki; and Soma, Takashi, 4,182,958, Cl. 250-492.00A.
Somfai, Eva: *See*—
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resofszki, Gabor; and Gneth nee Zalantai, Livia, 4,182,892, Cl. 549-79.000.
Sonitronics, Inc.: *See*—
Feaster, Donavon L., 4,182,939, Cl. 200-17.00R.
Sonnenberg, Charles. Actuating system for a rental television. 4,183,057, Cl. 358-114.000.
Sony Corporation: *See*—
Amano, Toshio, 4,182,991, Cl. 325-459.000.
Isono, Katsuo; and Sanada, Seiji, 4,183,048, Cl. 358-28.000.
Kihara, Nobutoshi; and Watanabe, Yoshimi, 4,183,067, Cl. 360-75.000.
Kutaragi, Ken; and Nakamura, Masayoshi, 4,183,025, Cl. 324-103.00P.
Sahara, Hiroshi; and Tanaka, Yutaka, 4,183,064, Cl. 358-242.000.
Sawagata, Kiyoshi, 4,183,016, Cl. 340-347.0AD.
Tsuchiya, Takao; Omori, Shouji; Kuniyoshi, Yasunobu; Matsuzaki, Atsushi; Akazawa, Susumu; and Tominaga, Kiyonori, 4,183,050, Cl. 358-34.000.
Yamanaka, Seisuke; Nagumo, Fumio; and Nishimura, Toshimichi, 4,183,052, Cl. 358-50.000.
Sony Corporaton: *See*—
Wachi, Shigeaki, 4,183,079, Cl. 363-17.000.
Souder, James J.: *See*—
Hysen, P. Paul; Souder, James J.; and Waldorf, Lindsay E., 4,182,405, Cl. 165-48.000.
Spademan, Richard G. Step-in side-clamp safety ski release system. 4,182,525, Cl. 280-624.000.
Spanides, Moschoula. Control device for regulating the flow between a spout and a shower and capable of controlling the rate of flow from each independently of the hot and cold faucet handles. 4,182,374, Cl. 137-625.480.
Sparks, James D.: *See*—
Stratton, Michael K.; Engquist, Karl R.; Keske, Frank E.; Powers, Harold C.; and Sparks, James D., 4,182,122, Cl. 60-322.000.
Specialty Brands, Inc.: *See*—
Watson, Harold K., 4,182,451, Cl. 209-524.000.
Spence, Lewis C. Magnetic R.F. power splitter and power combiner. 4,182,996, Cl. 333-100.000.
Spencer, Dudley W. C. Hoof repair. 4,182,340, Cl. 128-336.000.
Speranza, George P.: *See*—
Nieh, Edward C. Y.; and Speranza, George P., 4,182,864, Cl. 544-352.000.
Sperry Rand Corporation: *See*—
Glass, Emmett F., 4,182,196, Cl. 74-491.000.
McMahon, Donald H., 4,182,544, Cl. 350-96.160.
Spivack, John D., to Ciba-Geigy Corporation. Hindered phenyl phosphites. 4,182,704, Cl. 260-45.8NT.
Spivey, William J., Jr., to Caterpillar Tractor Co. Control circuit for variable displacement pump with venturi bypass control. 4,182,125, Cl. 60-431.000.
Spofa, United Pharmaceutical Works: *See*—
Beran, Milos; Krepelka, Jiri; Semonsky, Miroslav; Rezabek, Karel; Seda, Miroslav; and Auskova, Marie, 4,182,883, Cl. 546-67.000.
Spong, Fred W.: *See*—
Barnette, William E.; and Spong, Fred W., 4,183,060, Cl. 358-128.000.
Spoor, Herbert: *See*—
Straub, Ferdinand; Spoor, Herbert; Schenck, Hans-Uwe; and Schwarz, Wolfgang, 4,182,851, Cl. 528-491.000.
Squarcialupi, Sergio, to Chimet S.p.A. Electrolytic silver and gold refining cell. 4,182,671, Cl. 204-276.000.
Square D Company: *See*—
Murphy, James E.; Atwood, Felix M.; and McDonald, Harold D., 4,182,928, Cl. 174-153.00R.
SSP Products, Inc.: *See*—
Lestak, Robert G.; and Christensen, Allison L., 4,182,379, Cl. 138-149.000.
Stahl, Robert L. Coupon confining bag method. 4,182,222, Cl. 93-35.00R.
Standard Oil Company (Indiana): *See*—
Fields, Ellis K.; Cerefice, Steven A.; and Paschke, Edward E., 4,182,847, Cl. 528-361.000.
Saunders, Elmer J.; and Lappin, Terry A., 4,182,777, Cl. 426-62.000.
Standard Oil Company (Ohio), The: *See*—
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., 4,182,907, Cl. 562-546.000.
Stanelle, Karl-Heinz. Apparatus for transferring flowable materials from a first vessel into a second vessel. 4,182,591, Cl. 414-291.000.
Stanke, Dennis A.; and Rentmeester, Paul C., to Trane Company, The. Temperature control for variable volume air conditioning system. 4,182,484, Cl. 236-1.00C.
Stanulis, Nancy U., to Smyth County Dialysis Unit. Pressure applying device. 4,182,338, Cl. 128-325.000.
Stauffer Chemical Company: *See*—
Baker, Don R.; and Walker, Frank H., 4,182,625, Cl. 71-105.000.
Chess, William B., 4,182,779, Cl. 426-558.000.
Steffanson, Robert S.: *See*—
Marshall, Cary S.; and Steffanson, Robert S., 4,182,850, Cl. 528-480.000.
Steinau, Peter, to Hoechst Aktiengesellschaft. Cigarette filter. 4,182,350, Cl. 131-269.000.
Steinberg, Hans; and Tepper, Volkmar, to Mannesmann Aktiengesellschaft. Transmission gear with power branching. 4,182,200, Cl. 74-664.000.
Sterling Drug Inc.: *See*—
Bailey, Denis M., 4,182,895, Cl. 548-378.000.
Collins, Joseph C.; and Diana, Guy D., 4,182,727, Cl. 260-465.00F.
Collins, Joseph C., 4,182,729, Cl. 260-590.00C.
Collins, Joseph C.; and Diana, Guy D., 4,182,761, Cl. 424-248.550.
Diana, Guy D., 4,182,759, Cl. 424-217.000.
Pradt, Louis A.; and Copa, William M., 4,182,648, Cl. 162-38.000.
Schmidt, Paul J.; and Hung, William M., 4,182,714, Cl. 260-315.000.
Sterling, Vaughn C.: *See*—
Collins, Edward J.; and Sterling, Vaughn C., 4,182,607, Cl. 431-359.000.
Stevenson, Richard L. Skateboard structure. 4,182,520, Cl. 280-87.04A.
Stewart, Alan G.; Whiteford, John; and Emmett, William J., to Concrete Industries (Monier) Limited. Method and apparatus for the combustion of crushed solid fuels. 4,182,245, Cl. 110-101.0CF.
Stonefield Developments, (Paisley) Limited: *See*—
Watson, Norman F., 4,182,199, Cl. 74-606.00R.
Storez, Franz J. F., to Saunier Duval. Electromagnetic safety mechanism. 4,183,000, Cl. 335-263.000.
Stortz, Robert K., to Harman International Industries, Inc. Vehicle thermometer for measuring outside temperature. 4,182,182, Cl. 73-343.00R.
Stover, William H.; and Hunter, Samuel A., to Exxon Research & Engineering Co. Compatibility additive for fuel oil blends. 4,182,613, Cl. 44-51.000.
Strachan, Robert; and Goodhouse, Carl J., to Robertshaw Controls Company. Control panel unit and timer unit and method therefor. 4,182,112, Cl. 58-39.500.
Strang, Robert: *See*—
Jenkner, Herbert; and Strang, Robert, 4,182,706, Cl. 260-45.95G.
Stratton, Michael K.; Engquist, Karl R.; Keske, Frank E.; Powers, Harold C.; and Sparks, James D., to Caterpillar Tractor Co. Insulated exhaust manifold. 4,182,122, Cl. 60-322.000.
Straub, Ferdinand; Spoor, Herbert; Schenck, Hans-Uwe; and Schwarz, Wolfgang, to BASF Aktiengesellschaft. Process for reducing the residual monomer content in the polymerization of vinyl-lactams and vinyl esters. 4,182,851, Cl. 528-491.000.
Strauss, Georg; Portz, Wilhelm; Braun, Albert; Kandler, Joachim; Komorniczyk, Klaus; and Thiel, Hans-Dieter, to Hoechst Aktiengesellschaft. Production of granular compositions containing pulverulent magnesium. 4,182,626, Cl. 75-58.000.
Straziota, Maurizio: *See*—
Serboli, Giancarlo; Straziota, Maurizio; and La Barba, Nicolina, 4,182,804, Cl. 525-56.000.
Stricklin, Robert S., Jr., to TRW Inc. Constant output light emitting device. 4,182,977, Cl. 315-158.000.
Striegl, Georg, to Ingersoll Maschinen und Werkzeuge GmbH. Milling cutter and indexable insert therefor. 4,182,587, Cl. 407-113.000.
Strong, Grant H.; and Lagrou, Donald J. Pipe snubber including reservoir and seal structure. 4,182,441, Cl. 188-312.000.
Stultz, Jeffery H.: *See*—
Giles, James H.; Stultz, Jeffery H.; and Jones, Sandra W., 4,182,920, Cl. 568-895.000.
Sturley, Richard A.: *See*—
DeWolfe, Douglas; Sturley, Richard A.; and McPhilmy, Francis E., 4,182,985, Cl. 324-220.000.
Sud, Kuldip K.: *See*—
Anwer, Jamil; Sud, Kuldip K.; and Wintrup, Karl, 4,182,659, Cl. 203-18.000.
Sugawara, Tohru: *See*—
Miki, Takuichi; Matsuo, Taisuke; Sugawara, Tohru; and Masuya, Hirotomo, 4,182,866, Cl. 544-27.000.
Sukle, Vincent F., to United States Steel Corporation. Double twist wire buncher. 4,182,104, Cl. 57-58.520.

Sulek, Harald: *See—*
Bauer, Johann; Birke, Hans; Fendel, Kurt; and Sulek, Harald, 4,182,819, Cl. 526-202.000.

Sullivan, Thomas E.; and Wright, Oscar L. Bloodcompatible functional polymers. 4,182,750, Cl. 424-1.000.

Sumitomo Chemical Company, Limited: *See—*
Kanagawa, Shuichi; and Miki, Tamotsu, 4,182,803, Cl. 526-313.000.
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; and Suzuki, Takatoshi, 4,182,852, Cl. 528-494.000.
Suzukamo, Gohu; and Nagase, Tsuneyuki, 4,182,906, Cl. 562-506.000.

Sumitomo Electric Industries, Ltd.: *See—*
Kimura, Ryoichi, 4,183,012, Cl. 340-52.00A.
Yokota, Minoru, 4,182,640, Cl. 148-32.000.

Sumitomo, Hiroyuki; Fukami, Katsutoshi; Kobayashi, Kazuyuki; Doi, Masafumi; Kawanishi, Kenzo; and Yoshida, Keido, to Hisaka Works Ltd. Plate type condenser. 4,182,411, Cl. 165-110.000.

Sumitomo, Hiroyuki: *See—*
Yoshida, Keido; Kobayashi, Kazuyuki; and Sumitomo, Hiroyuki, 4,182,410, Cl. 165-110.000.

Sun Ventures, Inc.: *See—*
Angstadt, Howard P.; and Bare, John P., 4,182,909, Cl. 568-574.000.
Lyons, James E., 4,182,722, Cl. 260-348.330.

Sundstrand Data Control, Inc.: *See—*
Hanson, Richard A., 4,182,187, Cl. 73-497.000.

Susaki, Wataru: *See—*
Namizaki, Hirofumi; Susaki, Wataru; and Kan, Hirofumi, 4,183,038, Cl. 357-17.000.

Sutich, Edward R., to Fabri-Tek Incorporated. Cubic magnetic core storage memory system. 4,183,092, Cl. 365-51.000.

Suzukamo, Gohu; and Nagase, Tsuneyuki, to Sumitomo Chemical Company, Limited. Racemization of optically active 2,2-dimethyl-3-(1'-alkenyl)-cyclopropane-1-carboxylic acids. 4,182,906, Cl. 562-506.000.

Suzuki, Hideaki; Ono, Tomoyoshi; Yamamoto, Wataru; and Yamaguchi, Masahiro, to Teijin Limited. Emulsion breaking material. 4,182,690, Cl. 252-358.000.

Suzuki, Noriyuki: *See—*
Nishida, Fusao; Ueno, Toshihiro; Yamada, Tomiaki; Suzuki, Noriyuki; Takeda, Takehiko; Yanagihara, Tsutomu; Adachi, Katsuhiko; Asanabe, Tadashi; Ohsato, Katsuaki; Tsuda, Kintaro; and Watanabe, Keiichiro, 4,182,745, Cl. 423-239.00A.

Suzuki, Shin-ichi: *See—*
Hayashi, Eisaku; Higashino, Takeo; and Suzuki, Shin-ichi, 4,182,878, Cl. 544-262.000.

Suzuki, Takatoshi: *See—*
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; and Suzuki, Takatoshi, 4,182,852, Cl. 528-494.000.

Suzuki, Toru: *See—*
Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,182,457, Cl. 215-1.00C.

Suzuki, Toshio; and Nakamura, Akito, to Toray Silicone Company, Ltd. Curable organopolysiloxane compositions. 4,182,824, Cl. 528-15.000.

Sweeney, Kevin M., to Simulaids, Inc. Disposable protective sleeve, having a pneumatic action, for a rigid splint board or the like. 4,182,320, Cl. 128-89.00R.

Sweet, Roger H.: *See—*
Gay, Derek J.; Wilson, Nicol S.; Sweet, Roger H.; and Berford, Saint E. B., 4,182,076, Cl. 46-265.000.

Sweet, Walter A. Bale loading and handling device. 4,182,593, Cl. 414-732.000.

Swenson, Paul F. Fluid actuated damper control apparatus. 4,182,483, Cl. 236-1.00G.

Swift, Logan D. Mailbox signal. 4,182,479, Cl. 232-35.000.

Swindell, Harold J., to Phillips Petroleum Company. Floating pressure control of fractionator system. 4,182,657, Cl. 203-2.000.

Switzer, William K.; and Wagner, Roland W., to Chemetron Corporation. Food stack loader. 4,182,207, Cl. 83-61.000.

Swodenk, Wolfgang: *See—*
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,182,917, Cl. 568-771.000.
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,182,918, Cl. 568-771.000.

Sylvester, Reginald E.: *See—*
Bakalyar, Stephen R.; and Sylvester, Reginald E., 4,182,184, Cl. 73-422.0GC.

Systems Technology, Inc.: *See—*
Allen, Richard W.; and Hogge, Jeffrey R., 4,182,053, Cl. 35-11.00R.

Szabo, Gabor: *See—*
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resofszki, Gabor; and Gneth nee Zalantai, Livia, 4,182,892, Cl. 549-79.000.

T.M. Invention Associates: *See—*
Castelluzzo, James M., 4,182,789, Cl. 428-40.000.

Tabet, Jean-Noel: *See—*
Denninger, Claude; Joly, Michel; and Tabet, Jean-Noel, 4,182,620, Cl. 71-65.000.

Tabet, Michael A. Twin flying saucer toy. 4,182,073, Cl. 46-74.00D.

Tada, Yasuyuki; and Ohta, Yutaka, to Kabushiki Kaisha Morita Seisakusho. Orthodontic unit disposition structure. 4,182,036, Cl. 433-2.000.

Taff, Anthony. Animal training device and method. 4,182,272, Cl. 119-29.000.

Taguchi, Shinichiro; and Aketagawa, Tokio, to Tokyo Shibaura Electric Co., Ltd. Semiconductor temperature compensation circuit. 4,182,962, Cl. 307-254.000.

Taguchi, Tetsuya: *See—*
Iwashita, Tomonori; Uchidoi, Masanori; Ichiyanagi, Toshikazu; Taguchi, Tetsuya; Iura, Yukio; and Aizawa, Hiroshi, 4,182,562, Cl. 354-173.000.

Taiko Denki Company Limited: *See—*
Murai, Unosuke, 4,183,091, Cl. 365-51.000.

Taira, Seizo: *See—*
Fujii, Setsuro; Kawamura, Hiroyuki; Taira, Seizo; Matsui, Ryoji; Sakurai, Yojiro; and Okutome, Toshiyuki, 4,182,897, Cl. 560-19.000.

Takagi, Toshio; Uemura, Katsuhiko; and Sakaguchi, Toshiaki, to Mitsubishi Denki Kabushiki Kaisha; and Tokyo Electric Power Co., Inc., The. Protective relaying system. 4,183,072, Cl. 361-68.000.

Takahashi, Kihei: *See—*
Yoshida, Hiroshi; Takahashi, Kihei; and Hayashi, Toyoaki, 4,182,007, Cl. 24-205.16C.

Takano, Hideo; Shimohori, Yukio; and Fukuda, Shigeho, to Hitachi Cable, Ltd. Method for producing foamed plastic insulated wires. 4,182,734, Cl. 264-40.500.

Takeda Chemical Industries, Ltd.: *See—*
Miki, Takuichi; Matsuo, Taisuke; Sugawara, Tohru; and Masuya, Hirotomo, 4,182,866, Cl. 544-27.000.
Ochiai, Michihiko; Morimoto, Akira; Matsushita, Yoshihiro; Aki, Osami; Okada, Taiiti; and Kawakita, Kenji, 4,182,868, Cl. 544-21.000.

Takeda, Takehiko: *See—*
Nishida, Fusao; Ueno, Toshihiro; Yamada, Tomiaki; Suzuki, Noriyuki; Takeda, Takehiko; Yanagihara, Tsutomu; Adachi, Katsuhiko; Asanabe, Tadashi; Ohsato, Katsuaki; Tsuda, Kintaro; and Watanabe, Keiichiro, 4,182,745, Cl. 423-239.00A.

Takeno, Hidekazu: *See—*
Kamiya, Takashi; Hashimoto, Masashi; Hemmi, Keiji; and Takeno, Hidekazu, 4,182,758, Cl. 424-211.000.

Takeuchi, Yasumasa: *See—*
Makino, Kenya; Komatsu, Koei; Takeuchi, Yasumasa; and Endo, Masayuki, 4,182,813, Cl. 526-92.000.

Takezono, Tetsuya; and Fujiwara, Yasuo, to Nippon Oil Company Ltd. Method for producing methyl tert-butyl ether and fuel composition containing the same. 4,182,913, Cl. 568-697.000.

Talbott, Gene B. Method and apparatus for crop transplanting. 4,182,247, Cl. 111-3.000.

Tally, David N.; and Marsh, Richard L., to Goodyear Tire & Rubber Company, The. Method for making corrugated hose. 4,182,019, Cl. 29-453.000.

Talmon, Wolfgang: *See—*
Dworak, Wilhelm; Muller, Karl-Heinz; and Talmon, Wolfgang, 4,182,602, Cl. 418-132.000.

Tam, Shirley Y.: *See—*
Biber, Conrad H.; Shenk, Edwin K.; and Tam, Shirley Y., 4,182,563, Cl. 354-197.000.

Tamaru, Munetaka, to Citizen Watch Co., Ltd. Electronic timepiece. 4,182,111, Cl. 58-23.00R.

Tanabe, Hidekatu: *See—*
Ishikawa, Hachiro; Tanabe, Hidekatu; and Usui, Keizo, 4,182,633, Cl. 127-46.00A.

Tanabe Seiyaku Co., Ltd.: *See—*
Tsujihara, Kenji; Ozeki, Masakatsu; and Arai, Yoshihisa, 4,182,757, Cl. 424-180.000.

Tanaka, Atsushi: *See—*
Yagi, Shizuo; Fujii, Isao; and Tanaka, Atsushi, 4,182,286, Cl. 123-75.00B.

Tanaka, Chiaki: *See—*
Mibu, Hiroaki; Ishihara, Tadashi; Tanaka, Chiaki; and Esaki, Shingo, 4,182,665, Cl. 204-159.150.

Tanaka, Yutaka: *See—*
Sahara, Hiroshi; and Tanaka, Yutaka, 4,183,064, Cl. 358-242.000.

Tano, Eiichi; and Urata, Shinji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera indication device. 4,182,556, Cl. 354-60.00L.

Tarmain, Edwin R.: *See—*
Patisaul, Charles R.; McDevitt, Fred R.; Tarmain, Edwin R.; and Monteith, Donald G., 4,183,054, Cl. 358-86.000.

Tashiro, Fuminori, to Kabushiki Kaisha Saginomiya Seisakusho. Improved pressure switch. 4,182,941, Cl. 200-83.00C.

Tassi, Lamberto: *See—*
Ballestrazzi, Aris; Tassi, Lamberto; and Tosarelli, Gianni, 4,182,096, Cl. 53-553.000.

Tateno, Hiroshi: *See—*
Kataoka, Shoei; Tateno, Hiroshi; Fujisada, Hiroyuki; Yamada, Hideo; Kawashima, Mitsuo; and Komamiya, Yasuo, 4,182,964, Cl. 307-299.000.

Tayco Developments, Inc.: *See—*
Taylor, Paul H., 4,182,529, Cl. 293-132.000.

Taylor, Andrew W.; Burton, George; and Clayton, John P., to Beecham Group Limited. Ketenimine intermediates for 6α-methoxy-α-carboxy penicillins. 4,182,710, Cl. 260-245.200.

Taylor, Paul H., to Tayco Developments, Inc. Vehicle diverting energy absorber bumper system. 4,182,529, Cl. 293-132.000.

Taylor, Richard J., to Micro Consultants, Limited. Video store. 4,183,058, Cl. 358-127.000.

TDK Electronics Co., Ltd.: *See—*
Fujita, Motoyoshi, 4,183,070, Cl. 360-128.000.

Technical Processing, Inc : *See—*
Schwartz, Nelson N., 4,182,702, Cl. 260-42.160.

Technion Research & Development Foundation Ltd.: *See*—
Grossman, Gershon, 4,182,013, Cl. 29-157.30V.
Tecumseh Products Company: *See*—
Morse, Robert L., 4,182,136, Cl. 62-503.000.
TED Bildplatten Aktiengesellschaft: *See*—
Dickopp, Gerald; Mahler, Gerhard; and Scholz, Werner, 4,183,043, Cl. 358-11.000.
Teigen, Bard C.: *See*—
Burton, Charles L.; and Teigen, Bard C., 4,182,277, Cl. 122-491.000.
Teijin Limited: *See*—
Suzuki, Hideaki; Ono, Tomoyoshi; Yamamoto, Wataru; and Yamaguchi, Masahiro, 4,182,690, Cl. 252-358.000.
Teknoterm Systems AB: *See*—
Eriksson, Lennart O. R., 4,182,487, Cl. 236-49.000.
Teledyne Industries, Inc.: *See*—
Nielsen, Ralph H.; and Payton, Patrick H., 4,182,744, Cl. 423-68.000.
Tepper, Volkmar: *See*—
Steinberg, Hans; and Tepper, Volkmar, 4,182,200, Cl. 74-664.000.
Teramoto, Kazuo, to Citizen Watch Co., Ltd. Calendar mechanism for timepieces. 4,182,109, Cl. 58-4.00R.
Terayama, Kenichi: *See*—
Yamada, Masaru; Mori, Atsushi; Sato, Yoshiyasu; Terayama, Kenichi; and Miyatani, Shogo, 4,182,634, Cl. 127-55.000.
Terra Tek, Inc.: *See*—
Green, Sidney J.; and Nielsen, Randy R., 4,182,215, Cl. 35-32.00T.
Terry, Charles E.: *See*—
Hooper, Robert C.; Harrover, Alexander J.; VanHoy, Michael J.; and Terry, Charles E., 4,182,781, Cl. 427-90.000.
Terschuren, Wolfgang: *See*—
Lather, Dieter; Terschuren, Wolfgang; Hannoschock, Kurt; Simoneit, Gunter; and Ries, Karl, 4,182,154, Cl. 73-1.0DV.
Tesei, Renato: *See*—
Illuminati, Gabriello; Romano, Ugo; and Tesei, Renato, 4,182,726, Cl. 260-463.000.
Tesson, Gerard, to Manufacture de Produits Chimiques Protex Societe Anonyme. Process for the preparation of cationically modified formaldehyde resins of prolonged stability. 4,182,839, Cl. 528-254.000.
Teufel, Hermann: *See*—
Bartmann, Wilhelm; Lerch, Ulrich; Teufel, Hermann; Scholkens, Bernward; and Beck, Gerhard, 4,182,773, Cl. 424-305.000.
Teulon, Jean-Marie, to Societe Hexachimie. Indane derivatives. 4,182,896, Cl. 560-8.000.
Texaco Development Corporation: *See*—
Nieh, Edward C. Y.; and Speranza, George P., 4,182,864, Cl. 544-352.000.
Yeakey, Ernest L.; and Waddill, Harold G., 4,182,845, Cl. 528-340.000.
Texaco Inc.: *See*—
Nolte, David G., 4,182,178, Cl. 73-299.000.
Texas Instruments Incorporated: *See*—
Hooper, Robert C.; Harrover, Alexander J.; VanHoy, Michael J.; and Terry, Charles E., 4,182,781, Cl. 427-90.000.
Textron, Inc.: *See*—
DeCaro, Charles J., 4,182,216, Cl. 85-70.000.
Moertel, George B., 4,182,600, Cl. 425-129.00R.
Thaman, Ronald N.: *See*—
MacCleary, Randall C.; and Thaman, Ronald N., 4,182,959, Cl. 250-492.00R.
Thauer, Peter, to Volkswagenwerk Aktiengesellschaft. Mixture-compressing, spark-ignited internal combustion engine having a combined throttle and compression control. 4,182,288, Cl. 123-78.0AA.
Thermo King Corporation: *See*—
Viegas, Herman H.; Johnson, Bruce D.; and Volk, Rodney H., 4,182,134, Cl. 62-298.000.
Theyse, Frederik H.; and Kelling, Fridtjof E. T., to Ultra Centrifuge Nederland N.V. Centrifuge for separating helium from natural gas. 4,182,480, Cl. 233-27.000.
Thiel, Hans-Dieter: *See*—
Strauss, Georg; Portz, Wilhelm; Braun, Albert; Kandler, Joachim; Komorniczyk, Klaus; and Thiel, Hans-Dieter, 4,182,626, Cl. 75-58.000.
Thiele, Kurt; Armed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, to Siegfried Aktiengesellschaft. Novel cholesterol-lowering compounds. 4,182,902, Cl. 562-468.000.
Thies, Jerome A.: *See*—
Klett, Gene R.; and Thies, Jerome A., 4,182,057, Cl. 37-141.00T.
Thies, Peter W.: *See*—
Asai, Akiji; Ban, Ivan; David, Samuel; and Thies, Peter W., 4,182,889, Cl. 546-197.000.
Thiokol Corporation: *See*—
Jackle, William A., 4,182,825, Cl. 528-44.000.
Schmidle, Claude J., 4,182,790, Cl. 428-260.000.
Schmidle, Claude J.; and Barclay, Robert, Jr., 4,182,848, Cl. 528-376.000.
Tholome, Roger, to Air Industrie. Method and apparatus for controlling automatic equipment for spraying coating products. 4,182,980, Cl. 318-467.000.
Thompson, James R.: *See*—
Ziebarth, Timothy D.; Hauser, Ray L.; Thompson, James R.; Harris, John F.; Gibbons, Michael P.; and Burton, Guy C., 4,182,423, Cl. 175-61.000.
Thompson, Neil E. S., to Petrolite Corporation. Polymer compositions containing as antioxidants substituted diaminopropanes. 4,182,705, Cl. 260-45.90R.
Thomson-Brandt: *See*—
Roullet, Gerald; Bortuzzo, Jean-Pierre; and Chevalier, Serge, 4,183,069, Cl. 360-102.000.
Three Parks Limited: *See*—
Hulscher, Rudolf A., 4,182,452, Cl. 209-569.000.
Ticketcheck International Limited: *See*—
Krokos, Tom; and Hofrichter, Richard C., 4,182,062, Cl. 40-209.000.
Timmins, Michael D.; and Trepanier, Larry L. Cable and hose marking machine. 4,182,239, Cl. 101-11.000.
Tioga Air Heaters Co.: *See*—
Muckelrath, Ernest R., 4,182,303, Cl. 126-72.000.
Tippin, Arthur D.; and White, Malcolm J., to Chubb & Son's Lock & Safe Co. Ltd. Key-operated locks. 4,182,145, Cl. 70-134.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Ueno, Hiroshi; Inaba, Naomi; Makishima, Tukuo; Watanabe, Koh; and Wada, Shozo, 4,182,691, Cl. 252-429.00B.
Tobe, Martin L.; Khokhar, Abdul R.; and Braddock, Peter D. M., to Rustenburg Platinum Mines Limited. Compositions containing platinum. 4,182,724, Cl. 260-429.00R.
Tobin, Thomas J.: *See*—
Meister, Otto; and Tobin, Thomas J., 4,183,005, Cl. 337-275.000.
Todokoro, Masatoshi. Toy television set. 4,182,071, Cl. 46-1.00R.
Todt, William H.: *See*—
Playfoot, Kerwin C.; and Todt, William H., 4,182,176, Cl. 73-290.00R.
Tohms, Gary R. Security stand for motorcycle. 4,182,454, Cl. 211-5.000.
Tokuji, Yoshida, to Yoshida Kogyo Kabushiki Kaisha. Method of manufacturing collectively stranded wires for communication cables. 4,182,105, Cl. 57-58.540.
Tokyo Electric Power Co., Inc., The: *See*—
Takagi, Toshio; Uemura, Katsuhiko; and Sakaguchi, Toshiaki, 4,183,072, Cl. 361-68.000.
Tokyo Medical and Dental University, President of: *See*—
Inaba, Yutaka, 4,182,343, Cl. 128-350.00R.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Ishii, Shouichi, 4,183,082, Cl. 363-89.000.
Miyake, Kazuhiko, 4,183,061, Cl. 358-183.000.
Taguchi, Shinichiro; and Aketagawa, Tokio, 4,182,962, Cl. 307-254.000.
Washida, Hiroshi; and Morita, Hiroshi, 4,182,551, Cl. 350-357.000.
Tomatis, Stefano. Curd mixer for making cottage cheese. 4,182,232, Cl. 99-461.000.
Tomich, John L. Heat transfer device. 4,182,306, Cl. 126-121.000.
Tomii, Kaoru; and Kohashi, Tadao, to Matsushita Electric Industrial Company, Limited. Projection type color television with a single cathode ray tube. 4,183,053, Cl. 358-60.000.
Tominaga, Kiyonori: *See*—
Tsuchiya, Takao; Omori, Shouji; Kuniyoshi, Yasunobu; Matsuzaki, Atsushi; Akazawa, Susumu; and Tominaga, Kiyonori, 4,183,050, Cl. 358-34.000.
Tomita, Satoru: *See*—
Ohbori, Tamio; Matsumoto, Fuyuhiko; and Tomita, Satoru, 4,183,032, Cl. 346-155.000.
Tomozawa, Yoshiaki. Free wheel hub with coaster brake. 4,182,194, Cl. 74-217.00B.
Tompkins, E. Crosby: *See*—
Casten, George P.; McKinney, Gordon R.; Newton, Roger E.; Tompkins, E. Crosby; and Weikel, John H., Jr., 4,182,763, Cl. 424-251.000.
Toray Industries, Inc.: *See*—
Nakayama, Takao; Yamazaki, Chikayasu; and Ohno, Michio, 4,182,167, Cl. 73-144.000.
Toray Silicone Company, Ltd.: *See*—
Suzuki, Toshio; and Nakamura, Akito, 4,182,824, Cl. 528-15.000.
Torii & Co., Ltd.: *See*—
Fujii, Setsuro; Kawamura, Hiroyuki; Taira, Seizo; Matsui, Ryoji; Sakurai, Yojiro; and Okutome, Toshiyuki, 4,182,897, Cl. 560-19.000.
Tosarelli, Gianni: *See*—
Ballestrazzi, Aris; Tassi, Lamberto; and Tosarelli, Gianni, 4,182,096, Cl. 53-553.000.
Townend, John: *See*—
Baskeyfield, Lewis J.; Bell, John D.; Townend, John; and Pollock, Simon D. A., 4,182,916, Cl. 568-734.000.
Toyama, Noboru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system for an internal combustion engine. 4,182,293, Cl. 123-119.00A.
Toyo Seikan Kaisha Limited: *See*—
Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,182,457, Cl. 215-1.00C.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Mabuchi, Shunsuke; Kumoi, Sadakatsu; and Tsuzuki, Kenji, 4,182,919, Cl. 568-861.000.
Toyoda-Koki Kabushiki-Kaisha: *See*—
Kato, Kiyotaka; and Ohya, Tadahiko, 4,182,021, Cl. 29-568.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Sato, Katsujiro; Nakanishi, Kiyoshi; and Okumura, Takeshi, 4,182,279, Cl. 123-30.00C.
Toyama, Noboru, 4,182,293, Cl. 123-119.00A.
Toyota Judosha Kogyo Kabushiki Kaisha: *See*—
Ono, Hironobu; and Bito, Minoru, 4,182,300, Cl. 123-198.00D.

Trane Company, The: *See*—
Stanke, Dennis A.; and Rentmeester, Paul C., 4,182,484, Cl. 236-1.00C.

Trantham, Joseph C.; and Meldau, Robert F., to Phillips Petroleum Company. Induced oil recovery process. 4,182,416, Cl. 166-245.000.

Trepanier, Larry L.: *See*—
Timmins, Michael D.; and Trepanier, Larry L., 4,182,239, Cl. 101-11.000.

Tri-N Associates, Inc.: *See*—
McClean, William G.; and Budge, Daniel C., 4,183,014, Cl. 340-204.000.

Trio Kabushiki Kaisha: *See*—
Yamada, Tsuneo; and Miyamoto, Yukihiko, 4,182,963, Cl. 307-268.000.

Triplex Safety Glass Company Limited: *See*—
Greenhalgh, Geoffrey, 4,182,619, Cl. 65-114.000.

TRW Inc.: *See*—
Stricklin, Robert S., Jr., 4,182,977, Cl. 315-158.000.

Tsai, Hu-Chu: *See*—
Sokol, Phillip E.; and Tsai, Hu-Chu, 4,182,612, Cl. 8-10.100.

Tschudy, Donald B., to Hoover Company, The. Fastening arrangement for upper fill tube on a soft bag cleaner. 4,182,618, Cl. 55-374.000.

Tsuchiya, Takao; Omori, Shouji; Kuniyoshi, Yasunobu; Matsuzaki, Atsushi; Akazawa, Susumu; and Tominaga, Kiyonori, to Sony Corporation. Clamping circuit for color television signals. 4,183,050, Cl. 358-34.000.

Tsuda, Kintaro: *See*—
Nishida, Fusao; Ueno, Toshihiro; Yamada, Tomiaki; Suzuki, Noriyuki; Takeda, Takehiko; Yanagihara, Tsutomu; Adachi, Katsuhiko; Asanabe, Tadashi; Ohsato, Katsuaki; Tsuda, Kintaro; and Watanabe, Keiichiro, 4,182,745, Cl. 423-239.00A.

Tsujihara, Kenji; Ozeki, Masakatsu; and Arai, Yoshihisa, to Tanabe Seiyaku Co., Ltd. Novel nitrosourea compounds and process for preparing the same. 4,182,757, Cl. 424-180.000.

Tsuzuki, Kenji: *See*—
Mabuchi, Shunsuke; Kumoi, Sadakatsu; and Tsuzuki, Kenji, 4,182,919, Cl. 568-861.000.

Tucker, Howard, to Imperial Chemical Industries Limited. Optically-active 1-aryloxy-2-propanol intermediates of (S)-absolute configuration. 4,182,911, Cl. 568-633.000.

Tukioka, Kotohiko: *See*—
Matumura, Nobuyoshi; and Tukioka, Kotohiko, 4,182,249, Cl. 112-158.00B.

Tung, Lu H.; and Lo, Grace Y-S., to Dow Chemical Company, The. Polyfunctional lithium containing initiator. 4,182,818, Cl. 526-173.000.

Turner, Newton C., Jr., to Genesco, Inc. Shoe construction with preformed sole. 4,182,055, Cl. 36-30.00R.

Tuson, Samuel: *See*—
Guillaume, Daniel; and Tuson, Samuel, 4,182,389, Cl. 141-387.000.

Tyler, Leslie B., to DBX Inc. Signal amplitude compression system. 4,182,993, Cl. 330-279.000.

Uchida, Masaaki: *See*—
Ikenoya, Yasuo; and Uchida, Masaaki, 4,182,297, Cl. 123-124.00A.

Uchida, Yasuo: *See*—
Oguchi, Masanobu; Ishikawa, Hidehiko; Okuyama, Haruyoski; Uchida, Yasuo; and Izawa, Kiyoshi, 4,182,560, Cl. 354-106.000.

Uchidoi, Masanori: *See*—
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Iwashita, Tomonori; and Shimizu, Masami, 4,182,557, Cl. 354-60.00R.
Iwashita, Tomonori; Uchidoi, Masanori; Ichiyanagi, Toshikazu; Taguchi, Tetsuya; Iura, Yukio; and Aizawa, Hiroshi, 4,182,562, Cl. 354-173.000.

Ueda, Tsuneo, to Fuji Electric Co., Ltd. Hydraulic power plant. 4,182,123, Cl. 60-325.000.

Ueda, Yasutsugu, to Bristol-Myers Company. Antibacterial agents of the β-lactam type. 4,182,711, Cl. 548-178.000.

Uehara, Hiroshi: *See*—
Nagai, Haruo; Uehara, Hiroshi; and Nunokawa, Kunikazu, 4,182,821, Cl. 526-240.000.

Uehara, Yoshio; Inaba, Minoru; Ishii, Noriyuki; and Kusumi, Yoshihisa, to Mitsui Petrochemical Industries, Ltd. Pipe for underdraining. 4,182,581, Cl. 405-43.000.

Uehara, Yoshio: *See*—
Hieda, Shozo; Uehara, Yoshio; and Inaba, Minoru, 4,182,580, Cl. 405-43.000.

Uemura, Katsuhiko: *See*—
Takagi, Toshio; Uemura, Katsuhiko; and Sakaguchi, Toshiaki, 4,183,072, Cl. 361-68.000.

Ueno, Hiroshi; Inaba, Naomi; Makishima, Tukuo; Watanabe, Koh; and Wada, Shozo, to Toa Nenryo Kogyo Kabushiki Kaisha. Titanium trichloride catalyst and process for the production thereof. 4,182,691, Cl. 252-429.00B.

Ueno, Toshihiro: *See*—
Nishida, Fusao; Ueno, Toshihiro; Yamada, Tomiaki; Suzuki, Noriyuki; Takeda, Takehiko; Yanagihara, Tsutomu; Adachi, Katsuhiko; Asanabe, Tadashi; Ohsato, Katsuaki; Tsuda, Kintaro; and Watanabe, Keiichiro, 4,182,745, Cl. 423-239.00A.

Ultra Centrifuge Nederland N.V.: *See*—
Theyse, Frederik H.; and Kelling, Fridtjof E. T., 4,182,480, Cl. 233-27.000.

Underground Surveys Corporation: *See*—
Everson, Benjamin A.; and Klotzbier, Kenneth D., 4,182,262, Cl. 118-44.000.

Union Carbide Corporation: *See*—
Fan, You-Ling, 4,182,699, Cl. 260-29.6PM.
Fry, John S., 4,182,732, Cl. 260-826.000.
Jones, Allen P.; and Knopf, Robert J., 4,182,827, Cl. 528-60.000.
Wynstra, John; and Schultz, Sidney J., 4,182,696, Cl. 260-17.200.

Uniroyal, Ltd.: *See*—
Znotins, Andrew A.; and Brewer, Arthur D., 4,182,716, Cl. 549-14.000.

United Foam Corporation: *See*—
Morgan, Charles W.; Robinson, Dale; and Farag, Farouk, 4,181,991, Cl. 5-400.000.

U.S. Natural Resources, Inc.: *See*—
Wolfe, Charles M.; and Hinton, Steven W., 4,182,048, Cl. 34-13.400.

United States of America
Agriculture: *See*—
Schmidt, Eric W.; Miga, Lawrence W.; and Gieseke, James A., 4,182,673, Cl. 209-45.000.
Army: *See*—
Rosenblum, Howard E., 4,182,933, Cl. 179-1.50R.
Energy: *See*—
Burkhardt, James H., Jr.; Henry, J. James; and Davenport, Clyde M., 4,183,055, Cl. 358-101.000.
Salyer, Ival O.; Botham, Ruth A.; and Ball, George L., III, 4,182,398, Cl. 165-1.000.
Health, Education & Welfare: *See*—
Ito, Yoichiro, 4,182,678, Cl. 210-198.00C.
National Aeronautics and Space Administration: *See*—
Culotta, Randolph F.; and Posey, Donald L., 4,182,158, Cl. 73-40.000.
Navy: *See*—
Borgmeier, Donald E.; and Higgs, Edward W., 4,182,495, Cl. 239-265.110.
Carlson, F. Paul; and Mitchell, Gordon L., 4,183,009, Cl. 367-117.000.
Crist, Ralph P., 4,183,008, Cl. 367-142.000.
Holman, James G., 4,183,023, Cl. 343-18.00E.
Powers, Gaylord D.; and Quist, Donald G., 4,182,949, Cl. 219-98.000.
Simmons, Robert E., 4,183,088, Cl. 364-717.000.

U.S. ParaPlate Corporation: *See*—
Bergstedt, Donald C., 4,182,354, Cl. 137-10.000.

U.S. Philips Corporation: *See*—
Boekhorst, Antonius, 4,182,978, Cl. 315-371.000.
Le Can, Claude J. P. F.; Hart, Cornelis M.; and Wulms, Hendricus E. J., 4,183,037, Cl. 357-44.000.
Van Ijzeren, Anton J., 4,182,974, Cl. 313-481.000.
Vrijssen, Gerardus A. H. M.; and De Haas, Franciscus C. M., 4,182,973, Cl. 313-456.000.

United States Steel Corporation: *See*—
Pignocco, Arthur J.; and Waitlevertch, Michael E., 4,182,639, Cl. 148-6.170.
Sukle, Vincent F., 4,182,104, Cl. 57-58.520.

United Technologies Corporation: *See*—
Nelson, Charles J., 4,182,598, Cl. 416-193.00A.

UOP Inc.: *See*—
Arndt, O. Harold; and Wilton, William L., 4,182,533, Cl. 297-284.000.
Carson, Don B.; and Purse, Frank V., 4,182,741, Cl. 422-211.000.
Shum, Ming S., 4,182,412, Cl. 165-133.000.

Upjohn Company, The: *See*—
Hoeksema, Herman, 4,182,855, Cl. 536-1.000.

Upton, Charles J.: *See*—
Crutchfield, Marvin M.; and Upton, Charles J., 4,182,718, Cl. 260-340.700.
Crutchfield, Marvin M.; Papanu, Victor D.; and Upton, Charles J., 4,182,900, Cl. 560-180.000.

Urata, Shinji: *See*—
Tano, Eiichi; and Urata, Shinji, 4,182,556, Cl. 354-60.00L.

Usui, Keizo: *See*—
Ishikawa, Hachiro; Tanabe, Hidekatu; and Usui, Keizo, 4,182,633, Cl. 127-46.00A.

Vaill, Ronald E.; and Phillips, William D., to Westinghouse Electric Corporation. Grid sleeve bulge tool. 4,182,152, Cl. 72-393.000.

VanderLans, Gerald J. Pipeline joint tester. 4,182,642, Cl. 156-121.000.

VandeWalker, James R. Automatic popcorn machine. 4,182,229, Cl. 99-323.600.

Van Hekle, Paul, to Watts, Ralph. Oil skimmer. 4,182,679, Cl. 210-242.00S.

VanHoy, Michael J.: *See*—
Hooper, Robert C.; Harrover, Alexander J.; VanHoy, Michael J.; and Terry, Charles E., 4,182,781, Cl. 427-90.000.

Van Ijzeren, Anton J., to U.S. Philips Corporation. Getter connected to cathode ray tube high voltage contact. 4,182,974, Cl. 313-481.000.

Van Landingham, John V.: *See*—
McDonald, Charles J.; Van Landingham, John V.; and Givens, Steven P., 4,182,417, Cl. 166-295.000.

Vanlautem, Noel; and Mulders, Julien, to Solvay & Cie. Process for the manufacture of salts of poly-alpha-hydroxyacrylic acids. 4,182,806, Cl. 525-369.000.

Vanlautem, Noel; Mulders, Julien; and Gilain, Jacques, to Solvay & Cie. Process for the manufacture of salts of hydroxycarboxylated polymers of reduced molecular weight. 4,182,807, Cl. 525-387.000.

Varian Associates, Inc.: *See*—
Hartmann, Charles H.; and Martin, Michael R., 4,182,740, Cl. 422-54.000.
Seppi, Edward J.; Harell, George S.; and Morehouse, Charles C., 4,182,311, Cl. 128-653.000.

Vas, Ran; Forrester, James S.; and Diamond, George A. Apparatus and method for detection of body tissue movement. 4,182,315, Cl. 128-687.000.

Vaseen, Vesper A. Converting oxygen to ozone by U.V. radiation of a halogen saturated hydrocarbon liquid containing dissolved or absorbed oxygen. 4,182,663, Cl. 204-157.10R.

Vassiliades, Anthony E.; and Vincent, David N., to Champion International Corporation. Microcapsular release system. 4,182,788, Cl. 428-40.000.

VEB Pentacon Dresden Kamera und Kinowerke: *See*—
Jurenz, Rolf; and Kodalle, Horst, 4,182,564, Cl. 354-200.000.

Veda, Inc.: *See*—
Henke, Donald L., 4,182,097, Cl. 56-1.000.

Versluis, Ronald: *See*—
Lagerwerf, Harry; and Versluis, Ronald, 4,182,407, Cl. 165-70.000.

Vibrac Corporation: *See*—
Searle, Robert F., 4,182,026, Cl. 29-596.000.

Viegas, Herman H.; Johnson, Bruce D.; and Volk, Rodney H., to Thermo King Corporation. Transport refrigeration unit. 4,182,134, Cl. 62-298.000.

Vigesaa, Myron L.: *See*—
Beveridge, Paul J.; and Vigesaa, Myron L., 4,182,404, Cl. 165-41.000.

Vincent, David N.: *See*—
Vassiliades, Anthony E.; and Vincent, David N., 4,182,788, Cl. 428-40.000.

Virgilio, Joseph A.; Wood, Thomas F.; Heilweil, Emanuel; and Brandman, Harold A., to Givaudan Corporation. Process for the preparation of substituted dihydrocinnamaldehydes via novel β-chlorocinnamaldehydes. 4,182,730, Cl. 260-599.000.

Vivitar Corporation: *See*—
Kreitzer, Melvyn H., 4,182,549, Cl. 350-215.000.

Vogt, Wilhelm: *See*—
Schmidt, Hans-Georg; Daum, Gerhard; and Vogt, Wilhelm, 4,182,910, Cl. 568-595.000.

Voith Transmit GmbH: *See*—
Bretzger, Reinhard; Kienle, Fritz; and Lindenthal, Hans, 4,182,011, Cl. 29-148.40A.

Volk, Rodney H.: *See*—
Viegas, Herman H.; Johnson, Bruce D.; and Volk, Rodney H., 4,182,134, Cl. 62-298.000.

Volkswagenwerk Aktiengesellschaft: *See*—
Emmenthal, Klaus-Dieter, 4,182,294, Cl. 123-119.00C.
Thauer, Peter, 4,182,288, Cl. 123-78.0AA.

Volodin, Jury I.: *See*—
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Mullins, Jerry M., 4,182,030, Cl. 29-753.000.

Vrijssen, Gerardus A. H. M.; and De Haas, Franciscus C. M., to U.S. Philips Corporation. Electric discharge tube. 4,182,973, Cl. 313-456.000.

Vsesojuzny Nauchno-Issledovatelsky Institut Komplexnoi Avtomatizatsii Neftyanoi I Gazovoi Promyshlennosti: *See*—
Sinelnikov, Alexandr V.; Patushinskaya, Raisa S.; Freidgeim, Lazar I.; Bizev, Anatoly A.; Druzhkova, Larisa M.; Salimov, Vyacheslav K.; Lebedich, Sergei P.; Lvov. Sergei L.; Minkina, Margarita E.; Shurygin, Alexandr P.; Levin, Valery S.; Faradzh-Zade, Solmaz A.; Lebedev, Igor V., deceased; and Lebedeva, Marina I., administrator, 4,182,358, Cl. 137-115.000.

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Wace, Peter F.: *See*—
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Wachi, Shigeaki, to Sony Corporaton. DC-AC inverter. 4,183,079, Cl. 363-17.000.

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Wada, Shozo: *See*—
Ueno, Hiroshi; Inaba, Naomi; Makishima, Tukuo; Watanabe, Koh; and Wada, Shozo, 4,182,691, Cl. 252-429.00B.

Waddill, Harold G.: *See*—
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Wagensonner, Eduard: *See*—
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Wagner, Clyde M.; and Wagner, John H. Solar powered electric toy top. 4,182,077, Cl. 46-248.000.

Wagner, John H.: *See*—
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Wagner, Karl-Heinz: *See*—
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Wagner, Roland W.: *See*—
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Wagner, Wesley R., to Keith Manufacturing. Blocking machine. 4,182,604, Cl. 425-237.000.

Waitlevertch, Michael E.: *See*—
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Wakayama, Hiromu: *See*—
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Wakeford, Christopher B.: *See*—
Cooper, Ronald H.; Goreham, Kenneth A.; and Wakeford, Christopher B., 4,182,009, Cl. 29-25.120.

Wakeman, Richard C., to Birotronics Ltd. Electronic musical instrument. 4,182,214, Cl. 84-1.280.

Waldau, Karl O. Closure arrangement for container. 4,182,461, Cl. 220-320.000.

Waldmann, Helmut: *See*—
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Waldorf, Lindsay E.: *See*—
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Walker, Frank S., Sr. Vehicle roof support member. 4,182,532, Cl. 296-137.00R.

Walker, Loren H.: *See*—
Cutler, John H.; and Walker, Loren H., 4,183,081, Cl. 363-81.000.

Walkowiak, Michael; Schulz, Hans-Hermann; and Rosenkranz, Hans J., to Bayer Aktiengesellschaft. Impression materials for dentistry. 4,182,829, Cl. 528-75.000.

Wallace, Clarence L. Manufacture of multi-layered electrical assemblies. 4,183,074, Cl. 361-402.000.

Wallace, Joseph J.: *See*—
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Walsh, Edward G., to Bell Telephone Laboratories, Incorporated. Reed spring relay construction. 4,182,999, Cl. 335-151.000.

Wang, Cheng-Chi; Pasko, John G.; Longo, Joseph T.; and Clarke, John E., to Rockwell International Corporation. Inverted heterojunction photodiode. 4,183,035, Cl. 357-30.000.

Wang, Richard H. S.: *See*—
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Ward, William P., to NCR Corporation. High density memory device. 4,183,095, Cl. 365-189.000.

Warshaw, Saul; and Loveland, Winton S. Swivel mounting for tape applying apparatus wipe down roller. 4,182,223, Cl. 93-36.900.

Washida, Hiroshi; and Morita, Hiroshi, to Tokyo Shibaura Electric Co., Ltd. Electrochromic display device. 4,182,551, Cl. 350-357.000.

Watanabe, Keiichiro: *See*—
Nishida, Fusao; Ueno, Toshihiro; Yamada, Tomiaki; Suzuki, Noriyuki; Takeda, Takehiko; Yanagihara, Tsutomu; Adachi, Katsuhiko; Asanabe, Tadashi; Ohsato, Katsuaki; Tsuda, Kintaro; and Watanabe, Keiichiro, 4,182,745, Cl. 423-239.00A.

Watanabe, Koh: *See*—
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Watanabe, Nanao; and Akimoto, Haruhito, to Koei Chemical Co., Ltd. 1,8-Naphthyridine compounds and process for preparing the same. 4,182,880, Cl. 546-13.000.

Watanabe, Yoshimi: *See*—
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Waters, John R.: *See*—
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Watson, Harold K., to Specialty Brands, Inc. Container level height detector. 4,182,451, Cl. 209-524.000.

Watson, James M., to Cosden Technology, Inc. Emergency polymerization inhibitor system for vinyl aromatic compounds. 4,182,658, Cl. 203-9.000.

Watson, Norman F., to Stonefield Developments, (Paisley) Limited. Power transmission gearbox. 4,182,199, Cl. 74-606.00R.

Watts, Ralph: *See*—
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Wayne, I. R.; and Krieger, Bernard, to Cober Electronics, Inc. Method and apparatus for eliminating microwave leakage at the conveyor portal of a microwave oven. 4,182,946, Cl. 219-10.55A.

Wearden, Thomas B.: *See*—
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Weaver, Floyd E. Building panel chord tie and method of tieing together precast concrete building panels. 4,182,092, Cl. 52-583.000.

Webb, Terence C.: *See*—
Kitzing, Rainer; Scott, John G. V.; Webb, Terence C.; and Evans, Graham, 4,182,886, Cl. 546-304.000.

Weikel, John H., Jr.: *See*—
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Weisbrod, Sherman, to RCA Corporation. Row addressing apparatus for a bistable display device. 4,183,062, Cl. 358-230.000.

Weissman, Bernard, to Ipco Hospital Supply Corporation. Dental model trimmer. 4,182,615, Cl. 51-125.000.

Welch, Melvin B.: *See*—
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Funk, Gerhard; Weller, Eberhard; Renovanz, Hans-Dietrich; and Papendick, Uwe, 4,182,183, Cl. 73-362.0AR.
Wellman, Donald C., to Carrier Corporation. Discharge housing assembly for a vane axial fan. 4,182,596, Cl. 415-207.000.
Welstead, William J., Jr.; and Moran, Henry W., to A. H. Robins Company, Incorporated. Method of inhibiting blood platelet aggregation with 2-amino-3-(5- and 6-)benzoylphenylacetic acids, esters and metal salts thereof. 4,182,774, Cl. 424-309.000.
Wennberg, Lennart A.; and Danielsson, Ulf H. Flow meter. 4,182,172, Cl. 73-194.00B.
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Western Electric Company, Inc.: *See*—
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Larson, Daniel A., 4,182,976, Cl. 315-49.000.
MacFadden, John A.; and Ramsey, James E., 4,182,984, Cl. 324-152.000.
Mishra, Anil K.; Hammer, Joel B.; and Sochats, Kenneth M., 4,182,966, Cl. 310-59.000.
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Vaill, Ronald E.; and Phillips, William D., 4,182,152, Cl. 72-393.000.
Wolf, Joachim E.; and Locke, Philip F., Jr., 4,182,982, Cl. 324-127.000.
Young, Robert G., 4,182,975, Cl. 313-485.000.
Weyer, Rudi; Hitzel, Volker; and Granzer, Ernold, to Hoechst Aktiengesellschaft. Benzoic acids and process for their preparation. 4,182,775, Cl. 424-319.000.
Whitbread, Raymond J.: *See*—
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White, Ronald E.: *See*—
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Whiteford, John: *See*—
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Wichman, William J.; and Patterson, Robert W., to Anthony Manufacturing Corp. Anti side splash drive arm for an impact drive sprinkler. 4,182,494, Cl. 239-230.000.
Wick, Richard; and Wagensonner, Eduard, to AGFA-Gevaert, A.G. Motion-picture sound film projector. 4,182,554, Cl. 352-5.000.
Wickenden, Dennis K., to Elliott Brothers (London) Limited. Manufacture of electroluminescent display devices. 4,182,025, Cl. 29-577.00R.
Wied, Dennis N.; and Montgomery, Robert M., to Harris Corporation. Ruggedized acousto-optic waveguide. 4,182,543, Cl. 350-96.130.
Wieland, Dieter: *See*—
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Williams, Clarence E. Safety receptacle. 4,182,459, Cl. 220-88.00R.
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Williams, Ina L.: *See*—
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Williams, Keith R., to Babcock & Wilcox Company, The. Prevention of low temperature corrosion. 4,182,274, Cl. 122-4.00R.
Williams, Theodore R. Control circuit for solar energy heating systems. 4,182,309, Cl. 126-422.000.
Williams, Thomas R.: *See*—
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Wise, Charles D.; Lowrey, Ernest E.; Lowrey, Oliver W.; Williams, Thomas R.; and Neeley, Price, to Medical Plastics Laboratory, Inc. Artificial arm. 4,182,054, Cl. 35-17.000.
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Wladika, Hans; and Sevenich, Theodor, to Hoesch Werke Aktiengesellschaft. Hot rolling mill. 4,182,146, Cl. 72-202.000.
Wolf, Joachim E.; and Locke, Philip F., Jr., to Westinghouse Electric Corp. Current sensing transducer for power line current measurements. 4,182,982, Cl. 324-127.000.
Wolfe, Charles M.; and Hinton, Steven W., to U.S. Natural Resources, Inc. Method of drying lumber. 4,182,048, Cl. 34-13.400.
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Woltersdorf, Otto W., Jr.: *See*—
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Woodford, Joseph C., Sr., to Woodford Manufacturing Company. Sill cock assembly. 4,182,356, Cl. 137-59.000.
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Woodford, Joseph C., Sr., 4,182,356, Cl. 137-59.000.
Woodruff, Frank, to Bendix Corporation, The. Control valve for use with variable displacement piston pump. 4,182,365, Cl. 137-494.000.
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Worner, Gunter: *See*—
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Wright, George C.; and White, Ronald E., to Morton-Norwich Products, Inc. Ethyl 2-oxo-3-phenylethylaminopiperidine-4-carboxylate hydrochloride. 4,182,890, Cl. 546-221.000.
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Yagi, Osami; and Fujiwara, Yasuo, to Nippon Oil Company Limited. Oil soluble fungicide obtained from the reaction of a quaternary ammonium salt and an alkyl benzene sulfonic acid. 4,182,765, Cl. 424-263.000.
Yagi, Shizuo; Fujii, Isao; and Kogure, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Divided auxiliary combustion chamber for internal combustion spark ignition engines. 4,182,284, Cl. 123-75.00B.
Yagi, Shizuo; Fujii, Isao; and Nishikawa, Masayasu, to Honda Giken Kogyo Kabushiki Kaisha. Cylindrical torch passage construction for internal combustion engine. 4,182,285, Cl. 123-75.00B.

Yagi, Shizuo; Fujii, Isao; and Tanaka, Atsushi, to Honda Giken Kogyo Kabushiki Kaisha. Tapered torch passage construction for internal combustion. 4,182,286, Cl. 123-75.00B.

Yagi, Shizuo; Fujii, Isao; and Nishikawa, Masayasu, to Honda Giken Kogyo Kabushiki Kaisha. Torch passage construction for stratified charge engine. 4,182,287, Cl. 123-75.00B.

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Yamada, Hideo: *See*—
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Yamada, Kunitake: *See*—
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Yamada, Masaru; Mori, Atsushi; Sato, Yoshiyasu; Terayama, Kenichi; and Miyatani, Shogo, to Hokkaido Sugar Co., Ltd. Process for purifying maltose solution. 4,182,634, Cl. 127-55.000.

Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, to Toyo Seikan Kaisha Limited. Multilayer container. 4,182,457, Cl. 215-1.00C.

Yamada, Seiji; Yoshiyama, Ichiro; and Kitaura, Mashio, to Minolta Camera Kabushiki Kaisha. Exposure meter. 4,182,573, Cl. 356-218.000.

Yamada, Tomiaki: *See*—
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Yamada, Tsuneo; and Miyamoto, Yukihiko, to Trio Kabushiki Kaisha. Pulse shaping circuit. 4,182,963, Cl. 307-268.000.

Yamaguchi, Masahiro: *See*—
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Yamaguchi, Tamikazu, to Minolta Camera Kabushiki Kaisha. Modified gauss type lens system. 4,182,550, Cl. 350-215.000.

Yamamoto, Noboru: *See*—
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Yamamoto, Wataru: *See*—
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Yamanaka, Seisuke; Nagumo, Fumio; and Nishimura, Toshimichi, to Sony Corporation. Solid state color camera. 4,183,052, Cl. 358-50.000.

Yamauchi, Junichi; Yamada, Kunitake; and Shibatani, Kyoichiro, to Kuraray Company Limited. Adhesive compositions for the hard tissues of the human body. 4,182,035, Cl. 433-228.000.

Yamawaki, Naokuni: *See*—
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Yamazaki, Chikayasu: *See*—
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Yanagihara, Tsutomu: *See*—
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Yazaki, Jinichi: *See*—
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Yeakey, Ernest L.; and Waddill, Harold G., to Texaco Development Corporation. Preparation of polyamide thermoplastic adhesive from polyoxypropylene polyamine and piperazine. 4,182,845, Cl. 528-340.000.

Yeates, Robert D. Downhole surge tools. 4,182,419, Cl. 166-318.000.

Yokota, Minoru, to Sumitomo Electric Industries, Ltd. Aluminum alloy electric conductor wire. 4,182,640, Cl. 148-32.000.

Yoneji, Satoshige; Higuchi, Yoshiharu; and Mori, Shushin, to Brother Kogyo Kabushiki Kaisha. Control system for a sewing machine. 4,182,252, Cl. 112-317.000.

Yoshida, Hiroshi, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener stringer. 4,182,006, Cl. 24-205.11F.

Yoshida, Hiroshi; Takahashi, Kihei; and Hayashi, Toyoaki, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener stringer. 4,182,007, Cl. 24-205.16C.

Yoshida, Keido; Kobayashi, Kazuyuki; and Sumitomo, Hiroyuki, to Hisaka Works Ltd. Plate type condenser. 4,182,410, Cl. 165-110.000.

Yoshida, Keido: *See*—
Sumitomo, Hiroyuki; Fukami, Katsutoshi; Kobayashi, Kazuyuki; Doi, Masafumi; Kawanishi, Kenzo; and Yoshida, Keido, 4,182,411, Cl. 165-110.000.

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Yoshihara, Satoshi; and Sekimura, Nobuyuki, to Canon Kabushiki Kaisha. Process of producing stripe filter. 4,182,647, Cl. 430-314.000.

Yoshiike, Nobuyuki: *See*—
Kondo, Shigeo; Yoshiike, Nobuyuki; and Fukai, Masakazu, 4,182,797, Cl. 429-191.000.

Yoshikuni, Yoshiaki: *See*—
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Young, Dale E., II. Incubator for salmonid eggs and alevin. 4,182,269, Cl. 119-3.000.

Young, Robert G., to Westinghouse Electric Corp. Compact fluorescent lamp having a partitioned envelope, and method of manufacture. 4,182,975, Cl. 313-485.000.

Youngblood, Thomas F.; Saxman, William C.; and Wilemon, Gerald F., to Dresser Industries, Inc. Large diameter bit with bridge mounted drive stem. 4,182,422, Cl. 175-53.000.

Youval, Anat; Frommer, Moshe A.; Movshovich, Shmuel; and Cojocaro, Adriana, to A. T. Ramot Plastics Ltd. Porous tubes and hollow profile structures and method of making same. 4,182,582, Cl. 405-45.000.

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Zajac, John. Process of etching with plasma etch gas. 4,182,646, Cl. 156-643.000.

Zecher, Wilfried; and Merten, Rudolf, to Bayer Aktiengesellschaft. Process for the preparation of hydantoin lacquers. 4,182,812, Cl. 528-73.000.

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Ziebarth, Timothy D.; Hauser, Ray L.; Thompson, James R.; Harris, John F.; Gibbons, Michael P.; and Burton, Guy C., to Burton/Hawks Inc. Whipstock and method for directional well drilling. 4,182,423, Cl. 175-61.000.

Zimmer, Peter; Kudlich, Hans; and Schweitzer, Karl, to Maschinenfabrik Peter Zimmer Aktiengesellschaft. Method of producing a perforated metal foil. 4,182,660, Cl. 204-11.000.

Znotins, Andrew A.; and Brewer, Arthur D., to Uniroyal, Ltd. Method of making 5,6-dihydro-2-methyl-N-phenyl-1,4-oxathiin-3-carboxamide. 4,182,716, Cl. 549-14.000.

Zondler, Helmut; Moser, Roland; and Audykowski, Thaddeus, to Ciba-Geigy Corporation. Curable composition containing 1,4-diaminobutane derivatives. 4,182,832, Cl. 528-103.000.

Zubarev, Anatoly I.; Osipovsky, Lev F.; and Shipov, Stanislav V., to Institut Gornogo Dela Akademii Nauk Kazakhskoi SSR. Pneumatic rock drill. 4,182,421, Cl. 173-105.000.

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Zurawin, Adam, to Adams Brush Mfg. Co., Inc. Container rack. 4,182,455, Cl. 211-71.000.

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Ackeret, Peter, to IDN Inventions and Development of Novelties AG. Holders for tape cassettes. Re. 30,184, Cl. 206-387.000.

Griswold, James L. Trench shoring assembly. Re. 30,185, Cl. 405-283.000.

Hong, Se J.; and Patel, Arvind M., to International Business Machines Corporation. Plural channel error correcting apparatus and methods. Re. 30,187, Cl. 340-146.1AL.

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Patel, Arvind M.: *See*—
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Popenoe, Charles H. Radio-frequency tuned-circuit microdisplacement transducer. Re. 30,183, Cl. 73-761.000.

Rubner, Roland; Kleeberg, Wolfgang; and Kuhn, Eberhard, to Siemens Aktiengesellschaft. Method for the preparation of relief structures. Re. 30,186, Cl. 430-325.000.

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Meek, Jack M.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,492, 1-8-80, Cl. 74.000.

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290 V 4,182,177
299 4,182,178
334 4,182,179
336 4,182,180
339 R 4,182,181
343 R 4,182,182
362 AR 4,182,183
422 GC 4,182,184
462 4,182,185
497 4,182,187
721 4,182,188
761 Re.30,183
4,182,189
794 4,182,190
803 4,182,191
818 4,182,192

CLASS 74

217 B 4,182,194
230.8 4,182,193
473 SW 4,182,195
491 4,182,196
505 4,182,197
513 4,182,198
606 R 4,182,199
664 4,182,200
713 4,182,201
781 R 4,182,202
834 4,182,203

CLASS 75

0.5 AC 4,182,627
58 4,182,626
153 4,182,628

CLASS 76

24 R 4,182,204

CLASS 82

3 4,182,205

CLASS 83

56 4,182,206
61 4,182,207
118 4,182,208
177 4,182,170
467 R 4,182,186

CLASS 84

1.01 4,182,209
4,182,210
4,182,211
1.03 4,182,212
1.15 4,182,213
1.28 4,182,214

CLASS 85

32 T 4,182,215
70 4,182,216
71 4,182,217
84 4,182,218

CLASS 91

186 4,182,219
217 4,182,220
378 4,182,221

CLASS 93

35 R 4,182,222
36.9 4,182,223
39 R 4,182,224
80 4,182,225

CLASS 98

40 D 4,182,227

CLASS 99

276 4,182,228
323.6 4,182,229
349 4,182,230
387 4,182,231
461 4,182,232
494 4,182,233
495 4,182,234
578 4,182,226

CLASS 100

3 4,182,235
8 4,182,236
35 4,182,237
99 4,182,238

CLASS 101

11 4,182,239
99 4,182,240
405 4,182,241

CLASS 102

22 R 4,182,242

CLASS 104

138 R 4,182,243

CLASS 106

281 R 4,182,631

CLASS 108

91 4,182,244

CLASS 110

101 CF 4,182,245
188 4,182,246

CLASS 111

3 4,182,247

CLASS 112

121.26 4,182,248
158 B 4,182,249
184 4,182,250
317 4,182,252
322 4,182,251

CLASS 114

72 4,182,253
74 A 4,182,254
126 4,182,255
282 4,182,256
333 4,182,257

CLASS 115

6.1 4,182,258

CLASS 118

26 4,182,260
31.5 4,182,261
44 4,182,262
60 4,182,263
306 4,182,264
500 4,182,265
621 4,182,266
712 4,182,259

CLASS 119

3 4,182,267
4,182,268
4,182,269
4 4,182,270
28 4,182,271
29 4,182,272
51.5 4,182,273

CLASS 122

4 R 4,182,274
7 R 4,182,275
412 4,182,276
491 4,182,277

CLASS 123

1 A 4,182,278
30 C 4,182,279
4,182,280
30 D 4,182,281
41.76 4,182,282
50 R 4,182,283
75 B 4,182,284
4,182,285
4,182,286
4,182,287
78 AA 4,182,288
90.16 4,182,289
90.39 4,182,290
103 R 4,182,291
119 A 4,182,293
119 C 4,182,294
119 EC 4,182,292
4,182,295
122 A 4,182,296
124 A 4,182,297
139 AW 4,182,298
188 R 4,182,299
198 D 4,182,300
246 4,182,301

CLASS 126

4 4,182,302
72 4,182,303
76 4,182,304
120 4,182,305
121 4,182,306
400 4,182,310
422 4,182,309
4,182,489
432 4,182,307
437 4,182,308

CLASS 127

5 4,182,632
46 A 4,182,633
55 4,182,634

CLASS 128

28 4,182,317
77 4,182,318
79 4,182,319
89 R 4,182,320
130 4,182,321
133 4,182,322
201.27 4,182,324
203.27 4,182,325
204.25 4,182,323
215 4,182,327
220 4,182,326
235 4,182,328
256 4,182,329
260 4,182,330
271 4,182,331
283 4,182,332
287 4,182,333
4,182,334
290 R 4,182,335
4,182,336
305.3 4,182,337
325 4,182,338
334 R 4,182,339
336 4,182,340
339 4,182,341
348 4,182,342
350 R 4,182,343
351 4,182,344
419 P 4,182,345
641 4,182,346
653 4,182,311
665 4,182,316
687 4,182,315
693 4,182,314
725 4,182,347
736 4,182,313

CLASS 131

10 R 4,182,348
140 C 4,182,349
269 4,182,350

CLASS 134

58 D 4,182,351
184 4,183,011

CLASS 135

19.5 4,182,352
4,182,353

CLASS 137

1 4,182,357
10 4,182,354
59 4,182,356
115 4,182,358
246.22 4,182,359
270 4,182,360
296 4,182,361
340 4,182,362
392 4,182,363
426 4,182,364
494 4,182,365
496 4,182,355
510 4,182,366
557 4,182,367
596.17 4,182,368
596.18 4,182,369
614.04 4,182,370
624.11 4,182,371
625.4 4,182,372
625.44 4,182,373
625.48 4,182,374
625.69 4,182,375
874 4,182,376

CLASS 138

30 4,182,377
112 4,182,378
149 4,182,379

CLASS 139

68 4,182,380
383 A 4,182,381

CLASS 140

3 R 4,182,382

CLASS 141

5 4,182,383
7 4,182,384
65 4,182,385
83 4,182,386
129 4,182,387
351 4,182,388
387 4,182,389

CLASS 145

1 A 4,182,390

CLASS 148

6.14 R 4,182,637
6.15 R 4,182,638
6.17 4,182,639
32 4,182,640
130 4,182,635
187 4,182,636

CLASS 150

1.5 R 4,182,391

CLASS 152

219 4,182,392
353 R 4,182,393

CLASS 156

77 4,182,641
121 4,182,642
151 4,182,643
310 4,182,644
361 4,182,645
643 4,182,646

CLASS 162

38 4,182,648
101 4,182,649

CLASS 164

4 4,182,394
7 4,182,395
243 4,182,396
443 4,182,397

CLASS 165

1 4,182,398
4,182,399
4,182,400
2 4,182,401
10 4,182,402
12 4,182,403
41 4,182,404
48 4,182,405
48 S 4,182,406
70 4,182,407
4,182,408
104 S 4,182,409
110 4,182,410
4,182,411
133 4,182,412
163 4,182,413

CLASS 166

74 4,182,414
85 4,182,415
245 4,182,416
295 4,182,417
298 4,182,418
318 4,182,419

CLASS 171

38 4,182,420

CLASS 173

105 4,182,421

CLASS 174

153 R 4,182,928

CLASS 175

53 4,182,422
61 4,182,423
211 4,182,424
228 4,182,425

CLASS 176

8 4,182,650
4,182,651
50 4,182,652

CLASS 178

22 4,182,929

CLASS 179

1 E 4,182,931
1 GS 4,182,932
1 R 4,182,930
1.5 R 4,182,933
7 R 4,182,934
15 AL 4,182,935
18 AH 4,182,936
110 B 4,182,937
147 4,182,938

CLASS 180

12 4,182,426
148 4,182,427

CLASS 181

114 4,182,428
144 4,182,429
224 4,182,430

CLASS 182

23 4,182,431
151 4,182,432

CLASS 186

1 AA 4,182,433

CLASS 188

1 B 4,182,434
72.7 4,182,435
77 R 4,182,436
251 A 4,182,437
312 4,182,441
322 4,182,438
335 4,182,439

CLASS 193

35 A 4,182,440

CLASS 195

4 4,182,654
63 4,182,655

CLASS 198

422 4,182,442
460 4,182,443
499 4,182,444
703 4,182,445

CLASS 200

17 R 4,182,939
19 R 4,182,940
80 R 4,182,952
83 C 4,182,941
148 A 4,182,942
159 R 4,182,943
315 4,182,944

CLASS 203

2 4,182,657
9 4,182,658
18 4,182,659

CLASS 204

11 4,182,660
78 4,182,661
101 4,182,662
157.1 H 4,182,664
157.1 R 4,182,663
159.15 4,182,665
195 L 4,182,668
195 M 4,182,667
195 P 4,182,666
213 4,182,669
252 4,182,670
276 4,182,671
302 4,182,672

CLASS 206

205 4,182,446
220 4,182,447
380 4,182,448
385 4,182,945
387 Re.30,184
441 4,182,449
448 4,182,450

CLASS 208

89 4,182,674

CLASS 209

45 4,182,673
524 4,182,451
569 4,182,452

CLASS 210

8 4,182,675
27 4,182,676
36 4,182,677
198 C 4,182,678
242 S 4,182,679
386 4,182,680

CLASS 211

4 4,182,453
5 4,182,454
71 4,182,455

CLASS 215

1 C 4,182,457
307 4,182,458

CLASS 219

10.55 A 4,182,946
70 4,182,947
98 4,182,949
137 R 4,182,950
160 4,182,951
541 4,182,948

CLASS 220

88 R 4,182,459
271 4,182,460
320 4,182,461
450 4,182,462

CLASS 221

26 4,182,463

CLASS 222

98 4,182,464
207 4,182,465
600 4,182,466

CLASS 224

29 R 4,182,467
4,182,468
150 4,182,469
183 4,182,470
326 4,182,471

CLASS 226

97 4,182,472
143 4,182,473

CLASS 227

99 4,182,474

CLASS 229

5.7 4,182,475
17 B 4,182,476
37 R 4,182,477
62 4,182,478

CLASS 232

35 4,182,479

CLASS 233

27 4,182,480

CLASS 235

449 4,182,481
454 4,182,482

CLASS 236

1 C 4,182,484
1 G 4,182,483
48 R 4,182,485
49 4,182,486
4,182,487
92 A 4,182,488

CLASS 239

3 4,182,490
11 4,182,491
92 4,182,492
183 4,182,493
230 4,182,494
265.11 4,182,495
492 4,182,496
532 4,182,497

CLASS 241

24 4,182,498
46.02 4,182,499

CLASS 242

118.7 4,182,500

CLASS 244

110 B 4,182,501
137 R 4,182,502
219 4,182,503

CLASS 248

49 4,182,504
220.4 4,182,505
656 4,182,506

CLASS 249

54 4,182,507

CLASS 250

231 SE 4,182,953
239 4,182,956
308 4,182,954
356 4,182,957
402 4,182,955
492 A 4,182,958
492 R 4,182,959

CLASS 252

8.1 4,182,681
8.6 4,182,682
99 4,182,683
4,182,684
117 4,182,685
119 4,182,686
194 4,182,687
305 4,182,688
330 4,182,689
358 4,182,690
429 B 4,182,691
455 Z 4,182,692
4,182,693
462 4,182,694

CLASS 260

6 4,182,695
17.2 4,182,696
19 R 4,182,697
23 XA 4,182,698
29.6 PM 4,182,699
37 N 4,182,700
37 SB 4,182,723
38 4,182,701
42.16 4,182,702
45.8 NT 4,182,704
45.8 RW 4,182,703
45.85 S 4,182,725
45.9 R 4,182,705
45.95 G 4,182,706
112.5 S 4,182,707
208 4,182,708
239.1 4,182,709
245.2 4,182,710
315 4,182,714
326.5 FL 4,182,715
333 4,182,717
340.7 4,182,718
340.9 R 4,182,719
343.3 R 4,182,720
347.8 4,182,721
348.33 4,182,722
429 R 4,182,724
463 4,182,726
465 F 4,182,727
544 Y 4,182,728
590 C 4,182,729
599 4,182,730
606.5 F 4,182,731
826 4,182,732
982 4,182,733

CLASS 264

40.5 4,182,734
54 4,182,735
117 4,182,736
135 4,182,737
210.2 4,182,738

CLASS 267

132 4,182,508

CLASS 272

93 4,182,509
4,182,510
145 4,182,511

CLASS 273

73 C 4,182,512
106.5 C 4,182,513
237 4,182,514
4,182,515
258 4,182,516

CLASS 274

23 R 4,182,517

CLASS 277

65 4,182,518
207 A 4,182,519

CLASS 280

87.04 A 4,182,520
202 4,182,521
278 4,182,522
605 4,182,523
618 4,182,524
624 4,182,525

CLASS 282

21 R 4,182,526

CLASS 289

1.5 4,182,527

CLASS 290

1 R 4,182,960

CLASS 292

169.17 4,182,528

CLASS 293

132 4,182,529

CLASS 294

73 4,182,530
90 4,182,531

CLASS 296

137 R 4,182,532

CLASS 297

284 4,182,533

CLASS 298

22 C 4,182,534

CLASS 303

9 4,182,535
115 4,182,536

CLASS 307

225 C 4,182,961
254 4,182,962
268 4,182,963
299 4,182,964
299 R 4,182,965

CLASS 308

4 A 4,182,537

CLASS 310

59 4,182,966
74 4,182,967

CLASS 312

12 4,182,538
333 4,182,539

CLASS 313

105 R 4,182,968
4,182,969
113 4,182,970
177 4,182,971
221 4,182,972
456 4,182,973
481 4,182,974
485 4,182,975

CLASS 315

49 4,182,976
158 4,182,977
371 4,182,978

CLASS 316

19 4,182,540

CLASS 318

434 4,182,979
467 4,182,980

CLASS 324

61 R 4,182,981
103 P 4,183,025
127 4,182,982
142 4,182,983
152 4,182,984
220 4,182,985
236 4,182,986
249 4,182,987

CLASS 325

41 4,182,988
53 4,182,989
364 4,182,990
459 4,182,991

CLASS 330

251 4,182,992
279 4,182,993

CLASS 331

1 A 4,182,994
94.5 H 4,182,995

CLASS 333

100 4,182,996
175 4,182,997

CLASS 335

151 4,182,998
4,182,999
263 4,183,000

CLASS 336

62 4,183,001
192 4,183,002

CLASS 337

156 4,183,003
273 4,183,004
275 4,183,005

CLASS 338

23 4,183,006

CLASS 339

125 R 4,182,541
217 S 4,182,542

CLASS 340

52 A 4,183,012
146.1 AL Re.30,187
146.3 AC 4,183,013
204 4,183,014
286 R 4,183,015
347 AD 4,183,016
384 R 4,183,017
396 4,183,018
539 4,183,019
629 4,183,020
753 4,183,021

CLASS 343

5 ST 4,183,024
6.8 R 4,183,022
18 E 4,183,023
715 4,183,026
726 4,183,027

CLASS 346

35 4,183,028
140 R 4,183,029
4,183,030
4,183,031
155 4,183,032

CLASS 350

96.13 4,182,543
96.16 4,182,544
96.20 4,182,545
96.21 4,182,546
96.26 4,182,547
103 4,182,548
215 4,182,549
4,182,550
303 4,182,552
336 4,182,553
357 4,182,551

CLASS 352

5 4,182,554

CLASS 354

25 4,182,555
60 L 4,182,556
60 R 4,182,557
62 4,182,558
105 4,182,559
106 4,182,560
145 4,182,561
173 4,182,562
197 4,182,563
200 4,182,564
224 4,182,565
268 4,182,566
299 4,182,567

CLASS 355

8 4,182,568
84 4,182,569

CLASS 356

28 4,182,570
53 4,182,571
127 4,182,572
218 4,182,573
318 4,182,574
430 4,182,575

CLASS 357

17 4,183,038
4,183,039
22 4,183,033
30 4,183,034
4,183,035
41 4,183,040
44 4,183,036
4,183,037
81 4,183,041
82 4,183,042

CLASS 358

11 4,183,043
17 4,183,044
22 4,183,045
4,183,046
27 4,183,047
28 4,183,048
4,183,049
34 4,183,050
36 4,183,051
50 4,183,052
60 4,183,053
86 4,183,054
101 4,183,055
108 4,183,056
114 4,183,057
127 4,183,058
128 4,183,059
4,183,060
183 4,183,061
230 4,183,062
237 4,183,063
242 4,183,064

CLASS 360

9 4,183,065
40 4,183,066
75 4,183,067
90 4,183,068
102 4,183,069
128 4,183,070

CLASS 361

59 4,183,071
68 4,183,072
345 4,183,073
402 4,183,074

CLASS 362

6 4,183,075
120 4,183,076
224 4,183,077
231 4,183,078

CLASS 363

17 4,183,079
18 4,183,080

81 4,183,081
89 4,183,082

CLASS 364

200 4,183,083
4,183,084
4,183,085
4,183,086
515 4,183,087
717 4,183,088
900 4,183,089
4,183,090

CLASS 365

51 4,183,091
4,183,092
104 4,183,093
127 4,183,094
189 4,183,095
222 4,183,096

CLASS 367

117 4,183,009
119 4,183,007
142 4,183,008
154 4,183,010

CLASS 400

221 4,182,576

CLASS 403

74 4,182,577
317 4,182,578
326 4,182,579

CLASS 405

43 4,182,580
4,182,581
45 4,182,582
48 4,182,583
195 4,182,584
283 Re.30,185
302 4,182,585

CLASS 406

87 4,182,586

CLASS 407

113 4,182,587

CLASS 408

14 4,182,588

CLASS 409

138 4,182,589

CLASS 414

24.5 4,182,590
291 4,182,591
412 4,182,592
685 4,182,456
732 4,182,593

CLASS 415

2 4,182,594
204 4,182,595
207 4,182,596

CLASS 416

134 A 4,182,597
193 A 4,182,598

CLASS 417

328 4,182,599

CLASS 418

132 4,182,602

CLASS 422

47 4,182,739
54 4,182,740
199 4,182,742
211 4,182,741
4,182,743

CLASS 423

68 4,182,744
239 A 4,182,745
415 A 4,182,746
491 4,182,747
579 4,182,748
659 4,182,749

CLASS 424

1 4,182,750
78 4,182,752
92 4,182,751
115 4,182,753
131 4,182,754
147 4,182,755
180 4,182,756
4,182,757
211 4,182,758
217 4,182,759
244 4,182,760
248.55 4,182,761
250 4,182,762
251 4,182,763
262 4,182,764
263 4,182,765
4,182,766
267 4,182,767
4,182,768
273 B 4,182,893
273 R 4,182,769
4,182,770
282 4,182,771
304 4,182,772
305 4,182,773
309 4,182,774
319 4,182,775
4,182,776

CLASS 425

97 4,182,601
129 R 4,182,600
133.1 4,182,603
237 4,182,604
311 4,182,605
461 4,182,606

CLASS 426

62 4,182,777
72 4,182,778
558 4,182,779
636 4,182,780

CLASS 427

90 4,182,781
195 4,182,782
248 B 4,182,783
304 4,182,784
361 4,182,785
428 4,182,786

CLASS 428

36 4,182,787
40 4,182,788
4,182,789
248 4,182,791
260 4,182,790
432 4,182,793
537 4,182,794

CLASS 429

13 4,182,795
111 4,182,796
191 4,182,797
213 4,182,798

CLASS 430

314 4,182,647
325 Re.30,186
338 4,182,629
558 4,182,630

CLASS 431

359 4,182,607
4,182,608

CLASS 432

234 4,182,609
237 4,182,610
245 4,182,611

CLASS 433

2 4,182,036
54 4,182,039
68 4,182,312
77 4,182,040
85 4,182,038
110 4,182,037
115 4,182,041
174 4,182,034
228 4,182,035

CLASS 435

2 4,182,653
34 4,182,656

CLASS 521

98 4,182,799

CLASS 525

56 4,182,804
336 4,182,805
369 4,182,806
375 4,182,800
387 4,182,807
437 4,182,840
4,182,841

CLASS 526

62 4,182,808
4,182,809
64 4,182,810
69 4,182,811
77 4,182,801
92 4,182,813
4,182,814
96 4,182,815
119 4,182,816
169 4,182,817
173 4,182,818
202 4,182,819
212 4,182,820
240 4,182,821
264 4,182,802
4,182,822
298 4,182,823
313 4,182,803

CLASS 528

15 4,182,824
44 4,182,825
57 4,182,826
60 4,182,827
69 4,182,828
73 4,182,812
75 4,182,829
4,182,830
103 4,182,831
4,182,832
120 4,182,833
168 4,182,834
4,182,835
4,182,836
4,182,837
202 4,182,838
254 4,182,839
292 4,182,842
326 4,182,843
332 4,182,792
335 4,182,844
340 4,182,845
341 4,182,846
361 4,182,847
376 4,182,848
392 4,182,849
480 4,182,850
491 4,182,851
494 4,182,852
500 4,182,854
503 4,182,853

CLASS 536

1 4,182,855
4 4,182,856
9 4,182,857
4,182,858
23 4,182,859
114 4,182,860

CLASS 542

440 4,182,862
441 4,182,861

CLASS 544

16 4,182,870
21 4,182,868
26 4,182,863
27 4,182,866
60 4,182,865
133 4,182,873
172 4,182,877
190 4,182,871
204 4,182,874
4,182,875
237 4,182,876
262 4,182,878
290 4,182,879
324 4,182,867
352 4,182,864
388 4,182,869
389 4,182,872

CLASS 546

13 4,182,880
22 4,182,881
31 4,182,882
67 4,182,883
72 4,182,884
76 4,182,885
119 4,182,887
193 4,182,888
197 4,182,889
221 4,182,890
243 4,182,891
304 4,182,886

CLASS 548

140 4,182,712
178 4,182,711
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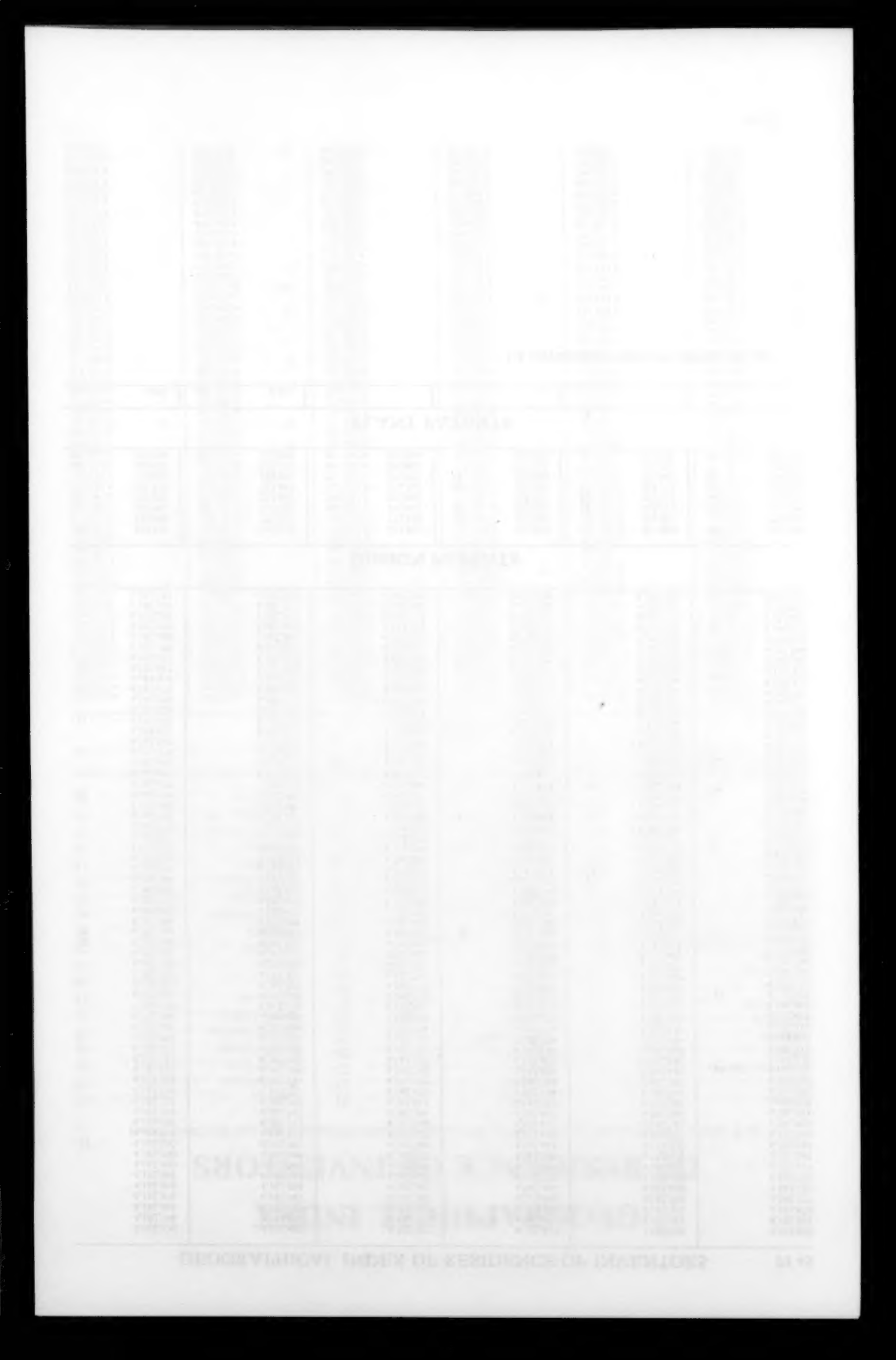

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